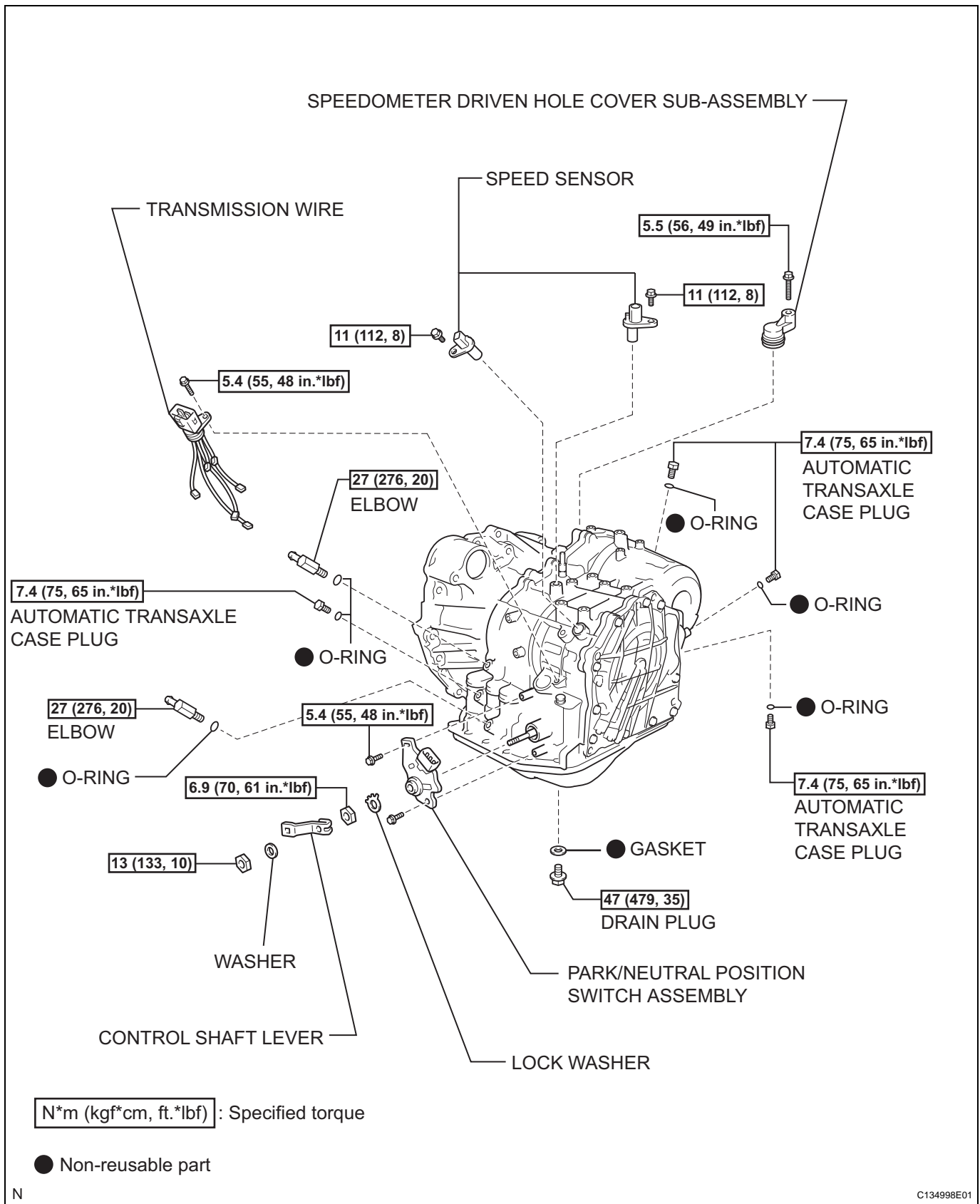


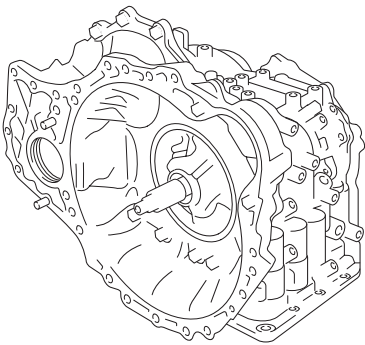
# AUTOMATIC TRANSAXLE UNIT

## COMPONENTS

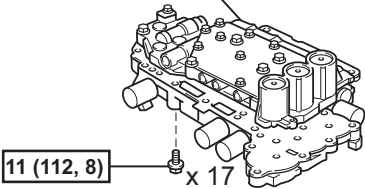
AX



AX

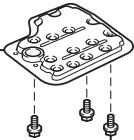


TRANSMISSION VALVE BODY ASSEMBLY



● O-RING

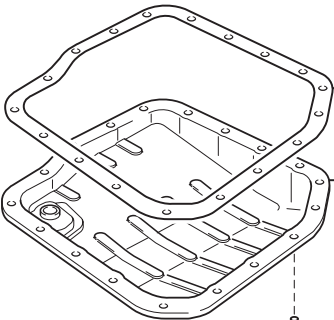
VALVE BODY OIL STRAINER ASSEMBLY



MAGNET



11 (112, 8)



● GASKET

AUTOMATIC TRANSAXLE OIL PAN SUB-ASSEMBLY

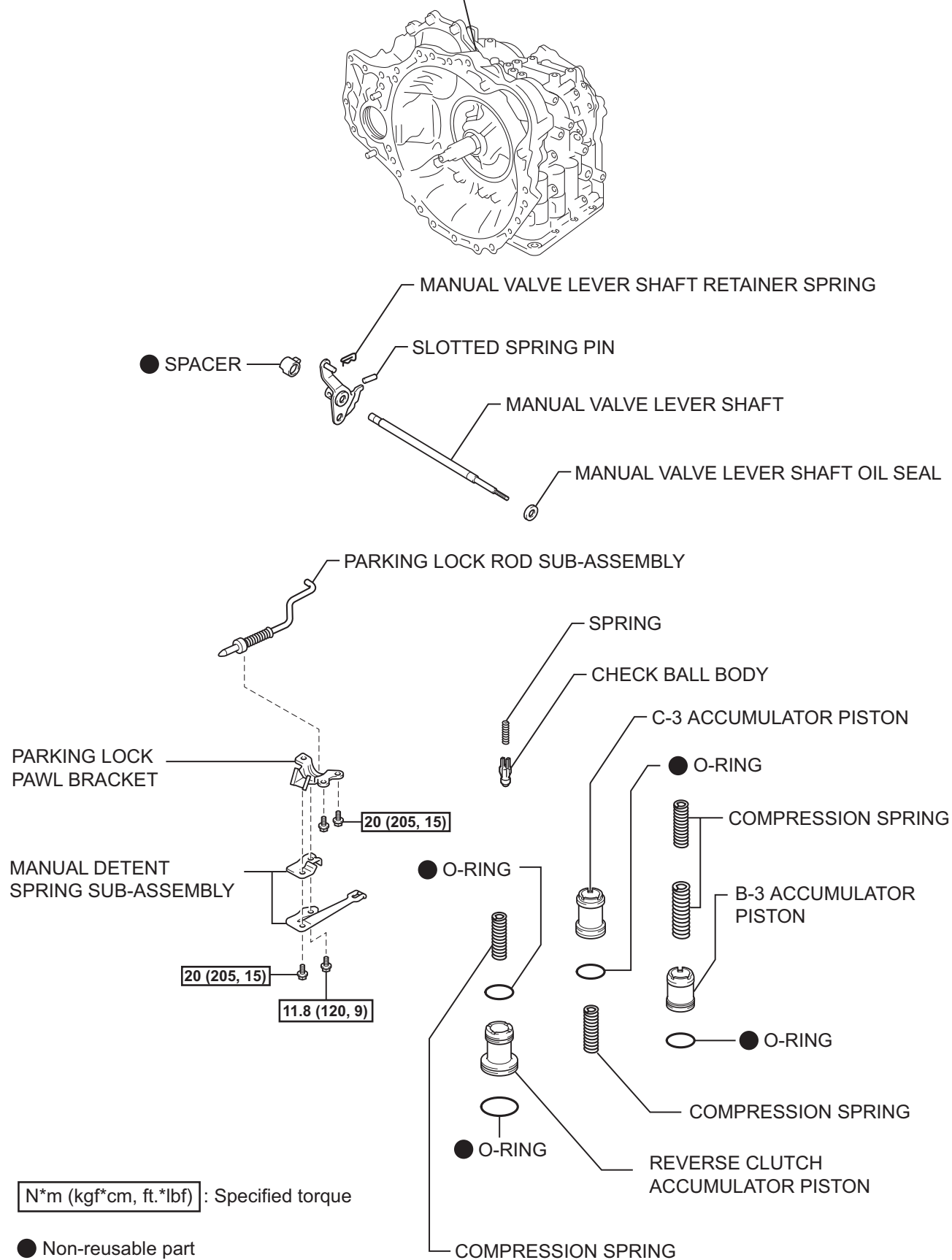
x 18

7.6 (77, 67 in.\*lbf)

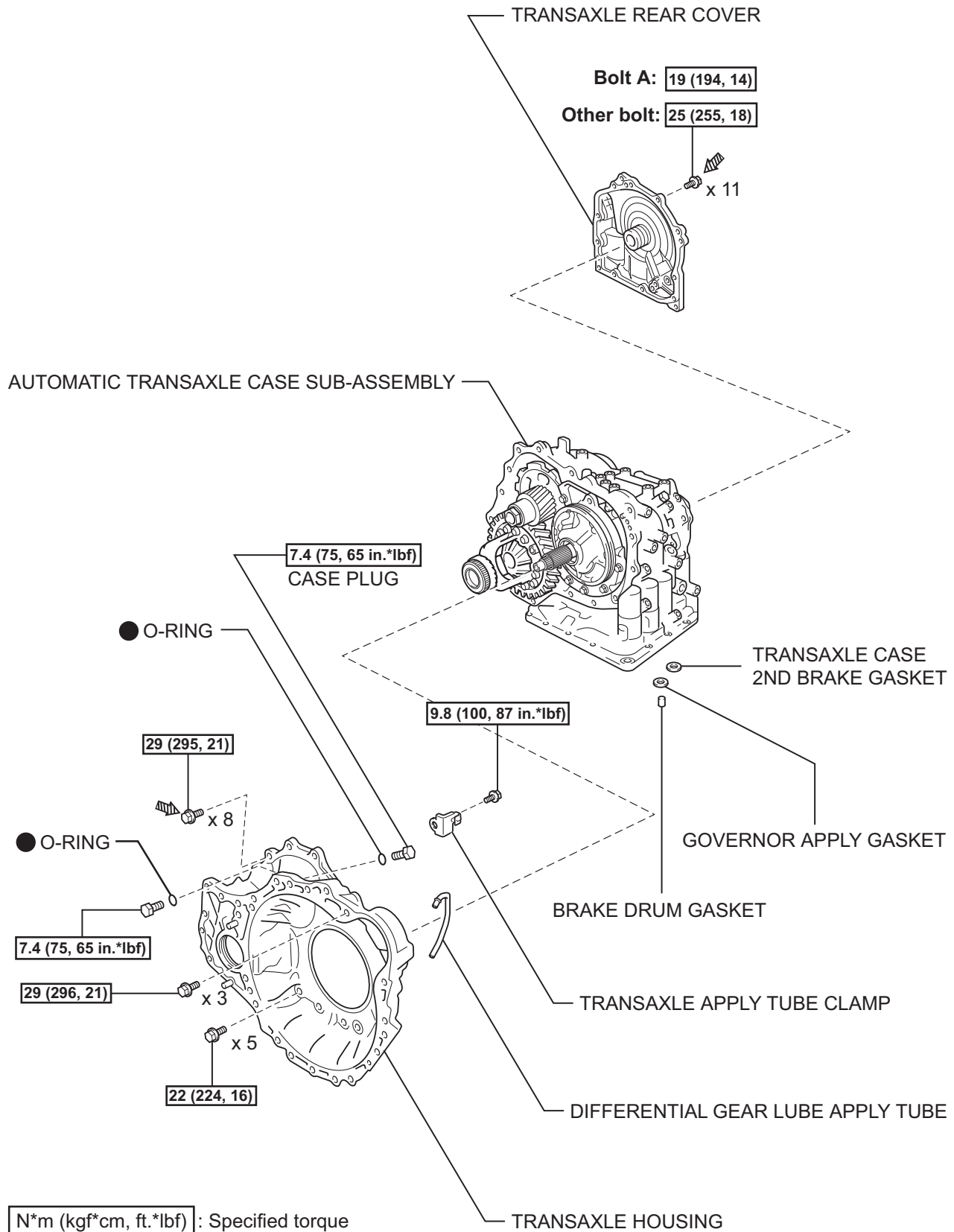
N\*m (kgf\*cm, ft.\*lbf) : Specified torque

● Non-reusable part

## AUTOMATIC TRANSAXLE CASE SUB-ASSEMBLY



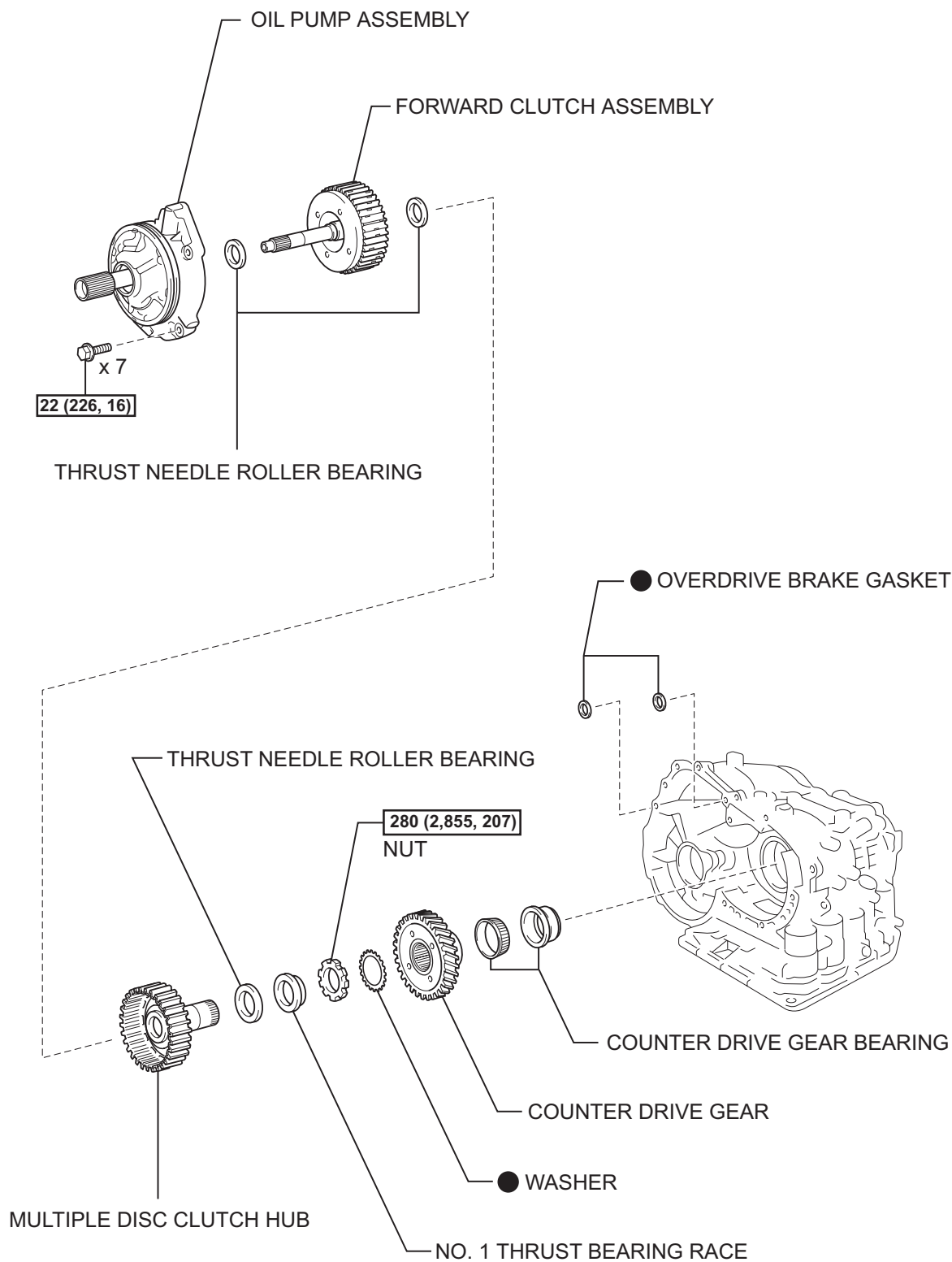
AX



N\*m (kgf\*cm, ft.\*lbf) : Specified torque

● Non-reusable part

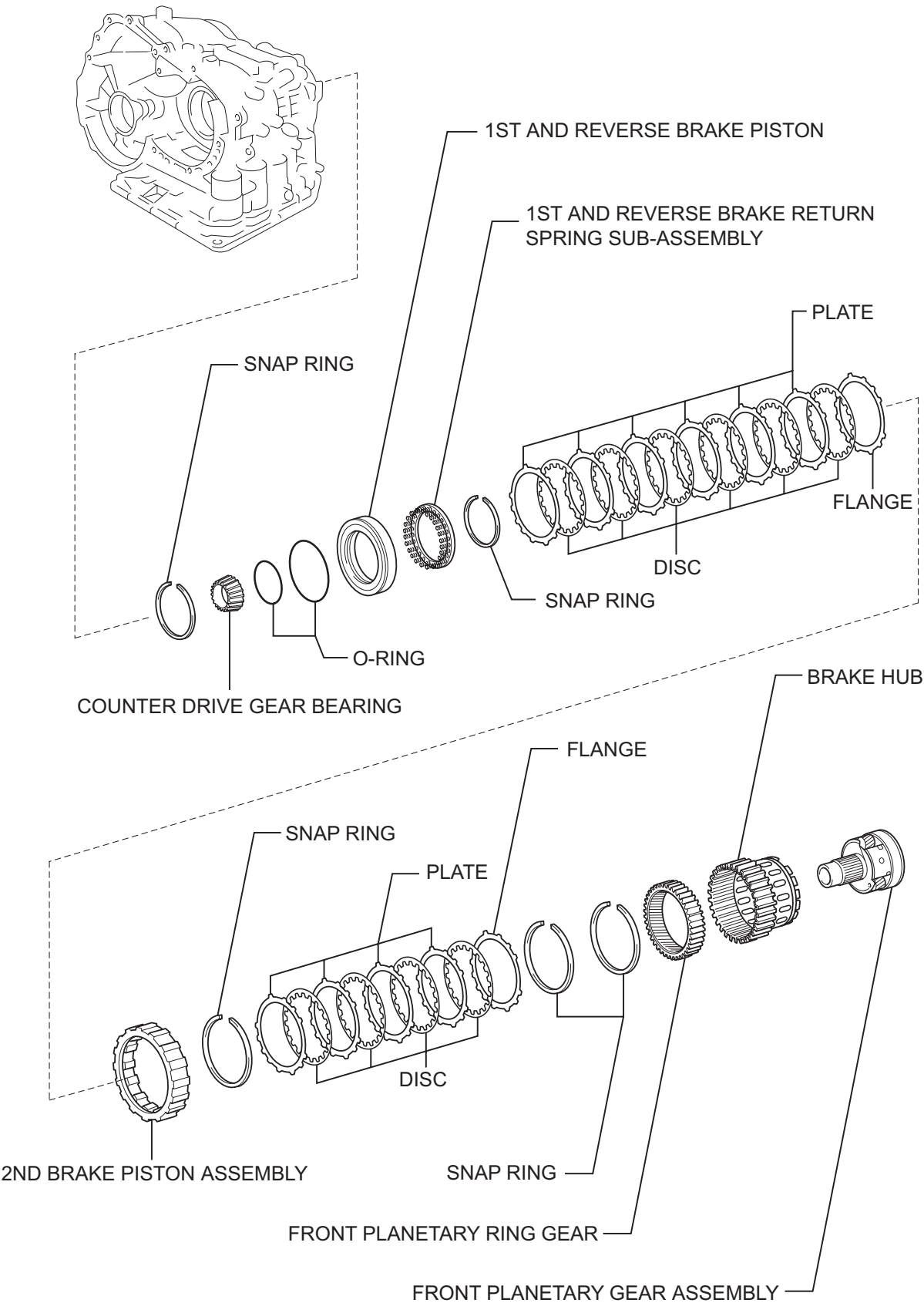
▧ Precoated part



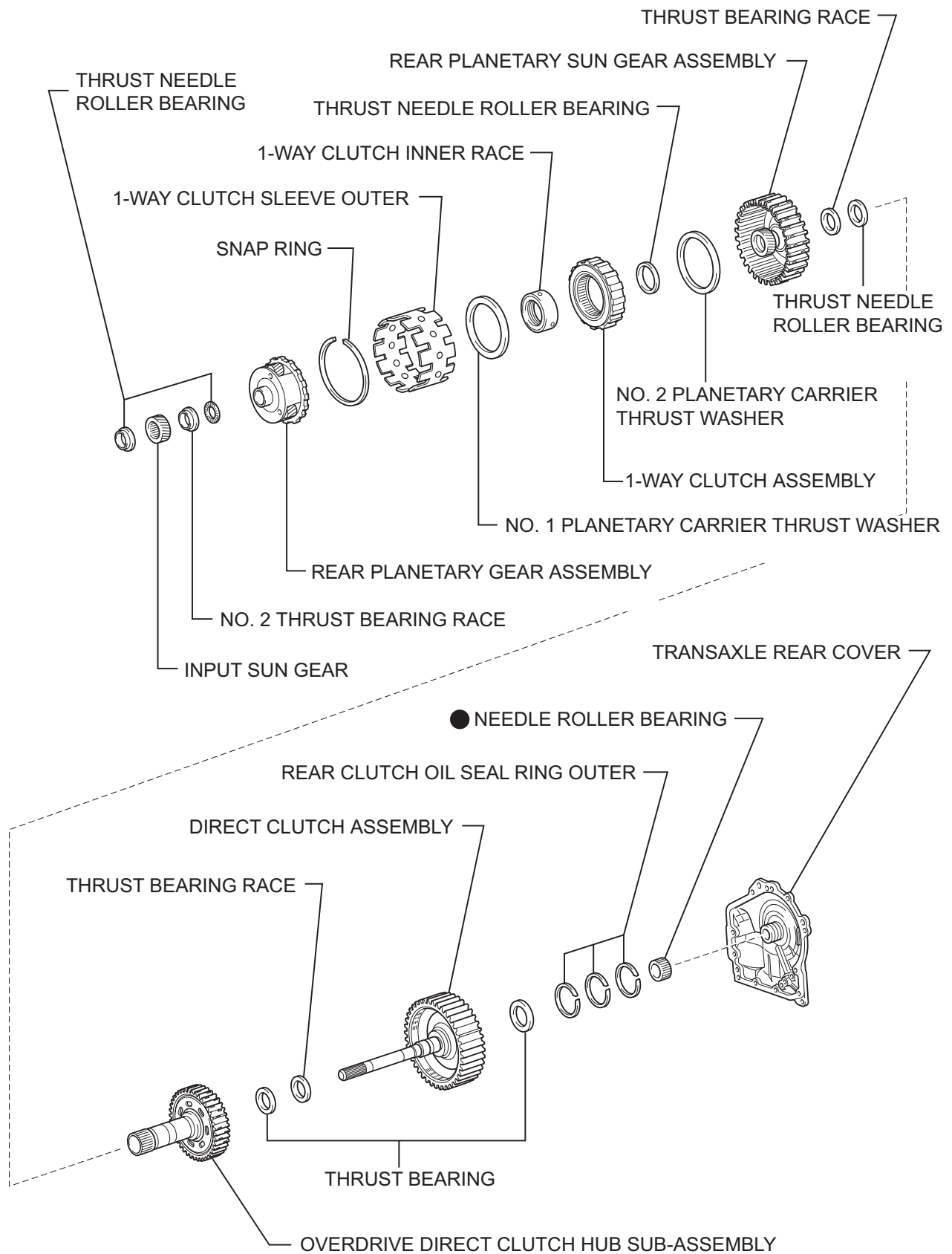
N\*m (kgf\*cm, ft.\*lbf) : Specified torque

● Non-reusable part

AX

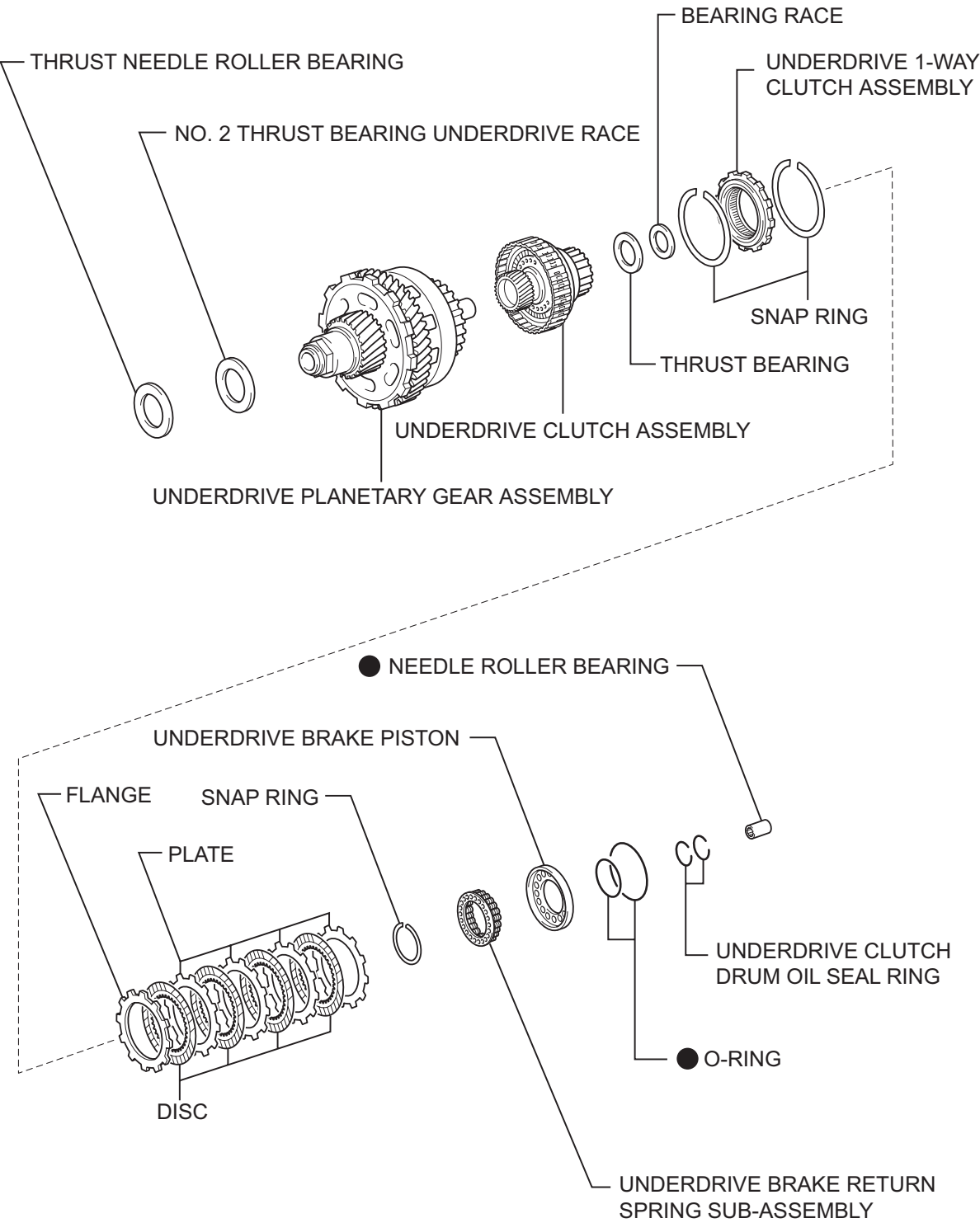


AX



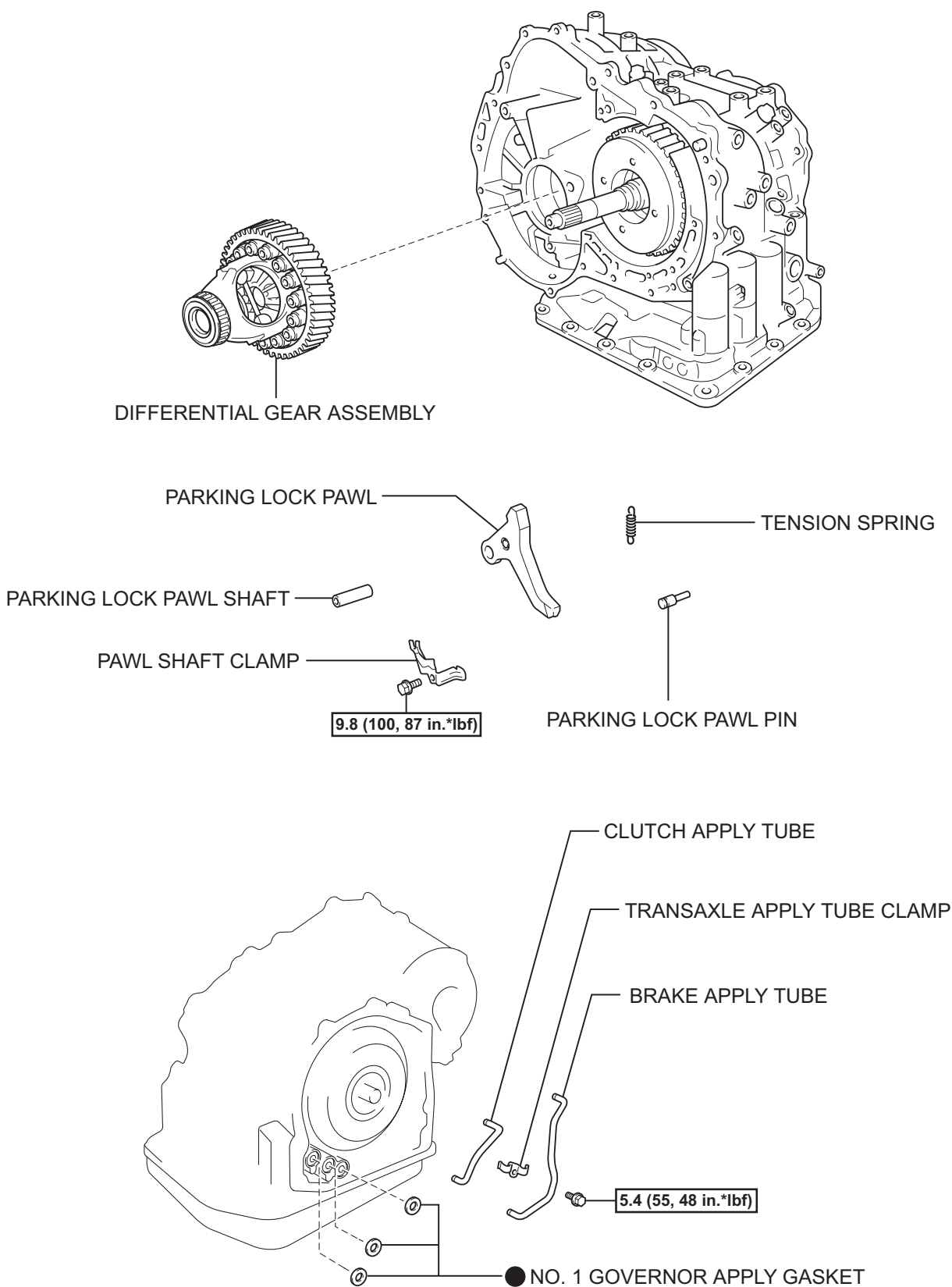
● Non-reusable part

AX



● Non-reusable part





**N\*m (kgf\*cm, ft.\*lbf)** : Specified torque

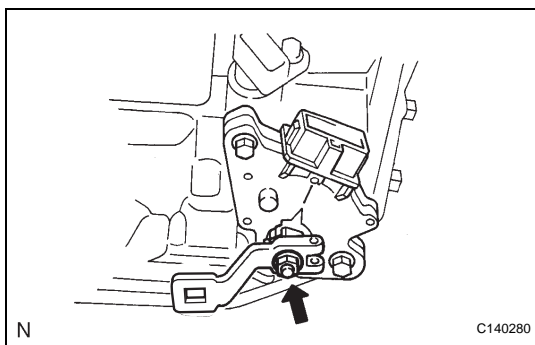
● Non-reusable part

AX

## DISASSEMBLY

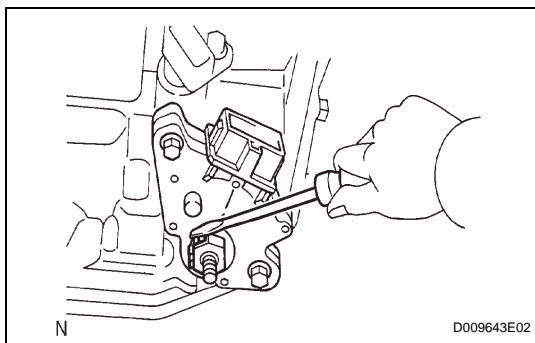
### 1. REMOVE PARK/NEUTRAL POSITION SWITCH ASSEMBLY

(a) Remove the nut, washer and control shaft lever.



(b) Using a screwdriver, pry off the lock plate.

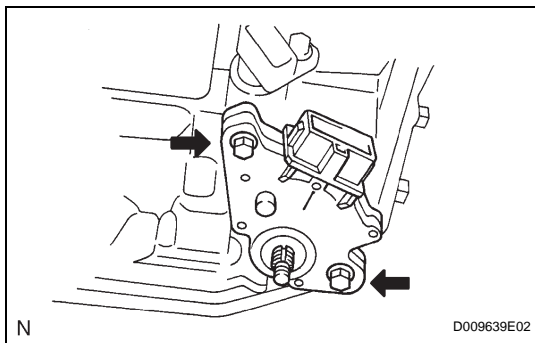
(c) Remove the nut and lock plate.



(d) Remove the 2 bolts and pull out the switch.

### 2. REMOVE BREATHER PLUG HOSE

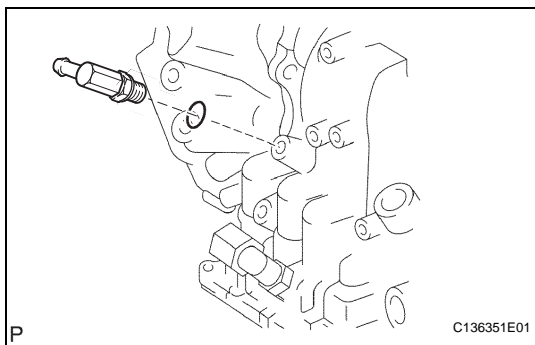
(a) Remove the breather plug hose from the transaxle case.



### 3. REMOVE OIL COOLER OUTLET TUBE ELBOW

(a) Remove the elbow.

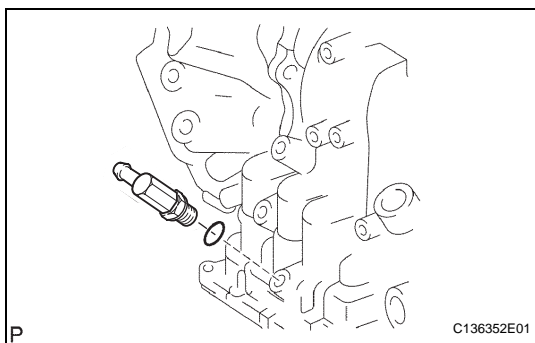
(b) Remove the O-ring from the elbow.

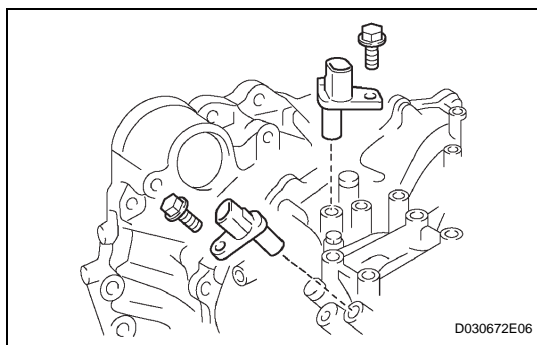


### 4. REMOVE OIL COOLER INLET TUBE ELBOW

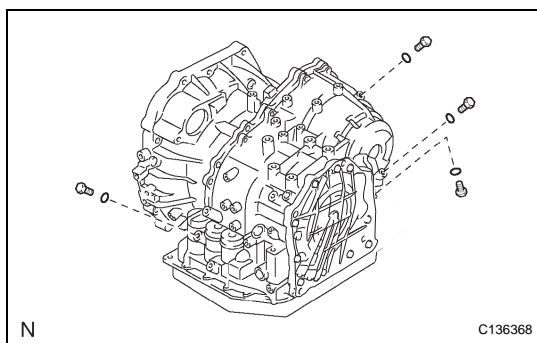
(a) Remove the elbow.

(b) Remove the O-ring from the elbow.



**5. REMOVE SPEED SENSOR**

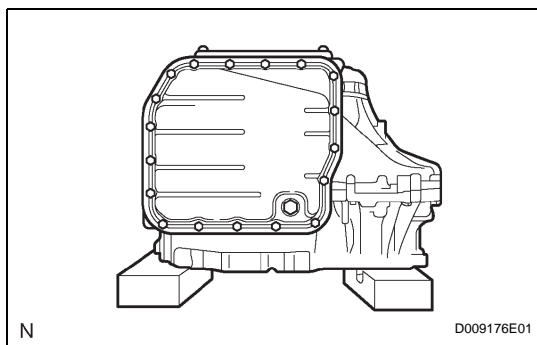
- (a) Remove the 2 bolts and the 2 speed sensors from the transaxle.

**6. REMOVE NO. 1 TRANSAXLE CASE PLUG**

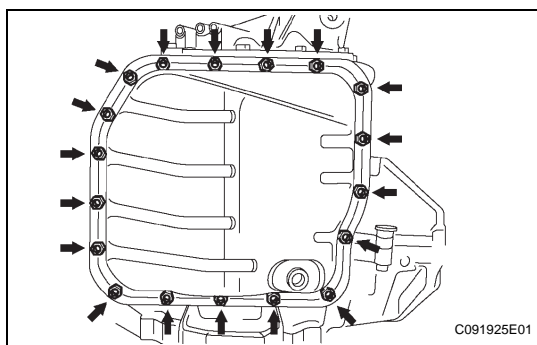
- (a) Remove the 4 plugs from the transaxle case.  
(b) Remove the 4 O-rings from the 4 plugs.

**7. REMOVE SPEEDOMETER DRIVEN HOLE COVER SUB-ASSEMBLY**

- (a) Remove the bolt and cover.  
(b) Remove the O-ring from the cover.

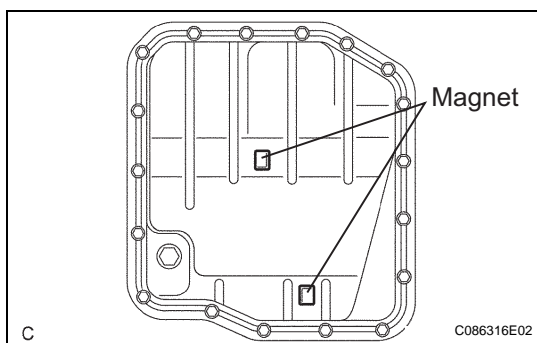
**8. FIX AUTOMATIC TRANSAXLE ASSEMBLY**

- (a) Fix the transaxle.

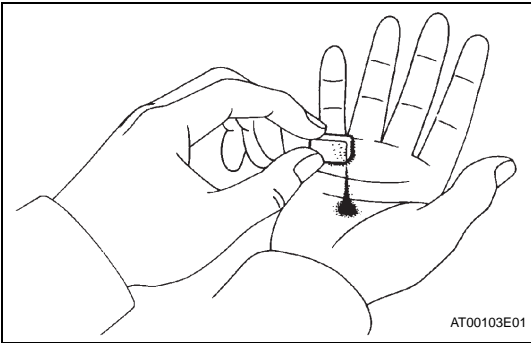
**9. REMOVE AUTOMATIC TRANSAXLE OIL PAN SUB-ASSEMBLY**

- (a) Remove the 18 bolts, oil pan and gasket.

- (b) Remove the 2 magnets from the oil pan.



AX



## 10. INSPECT TRANSMISSION OIL CLEANER MAGNET

- (a) Remove the magnets and use them to collect any steel chips. Examine the chips and particles in the pan and on the magnet to determine what type of wear has occurred in the transaxle.

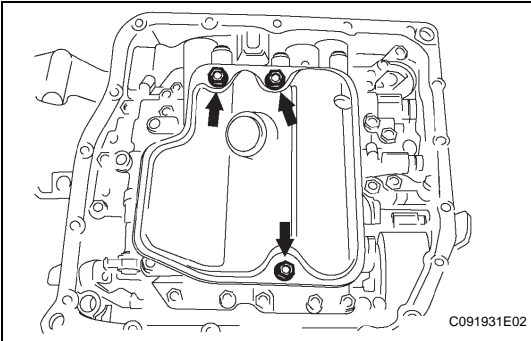
### Result:

**Steel (magnetic):**

**Wear of the bearing, gear and plate**

**Brass (non-magnetic):**

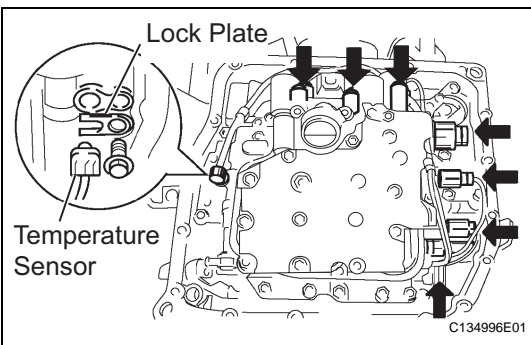
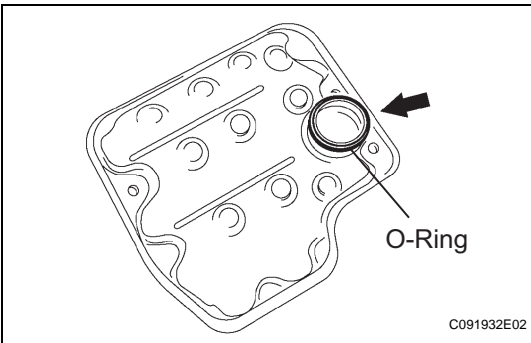
**Wear of the bush**



## 11. REMOVE VALVE BODY OIL STRAINER ASSEMBLY

- (a) Remove the 3 bolts and oil strainer.

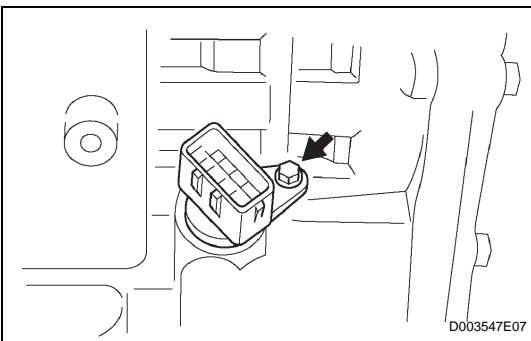
- (b) Remove the O-ring from the oil strainer.

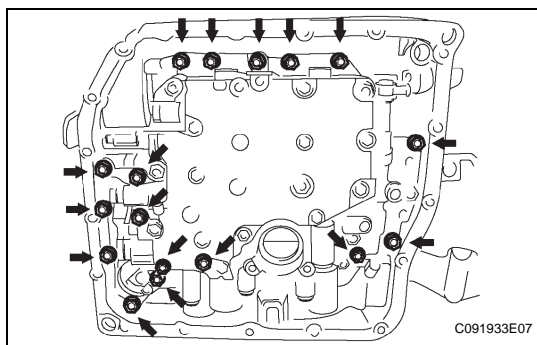


## 12. REMOVE TRANSMISSION WIRE

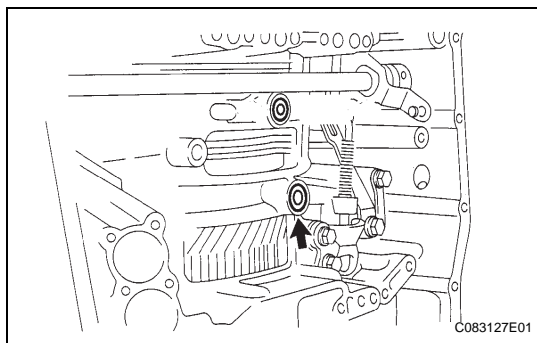
- (a) Remove the 7 connectors from the shift solenoid valves.
- (b) Remove the bolt, lock plate and temperature sensor.

- (c) Remove the bolt and transmission wire from the transaxle case.

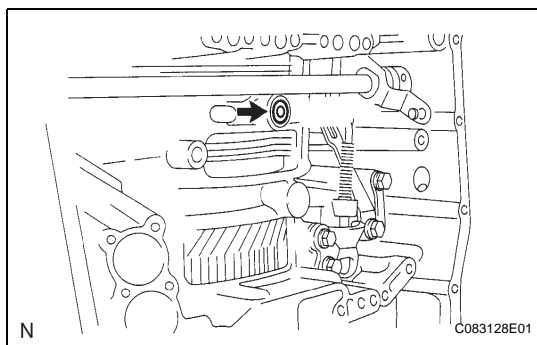


**13. REMOVE TRANSMISSION VALVE BODY ASSEMBLY**

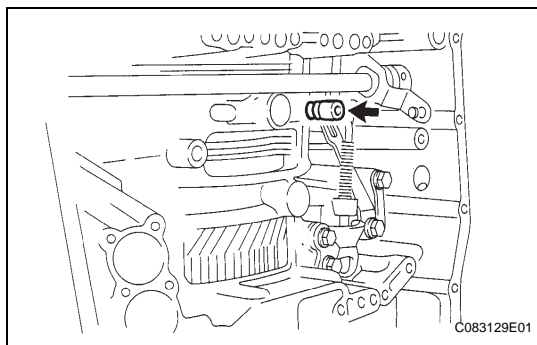
- (a) Support the valve body and remove the 17 bolts and valve body.

**14. REMOVE NO. 1 GOVERNOR APPLY GASKET**

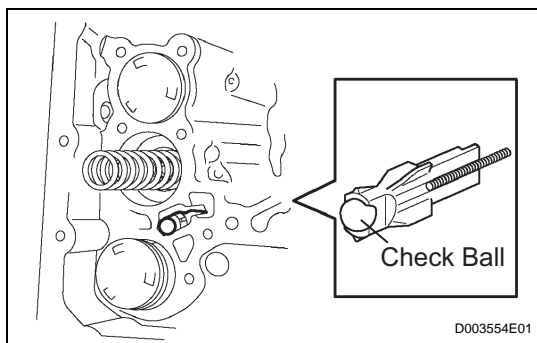
- (a) Remove the gasket from the transaxle case.

**15. REMOVE TRANSAXLE CASE 2ND BRAKE GASKET**

- (a) Remove the gasket from the transaxle case.

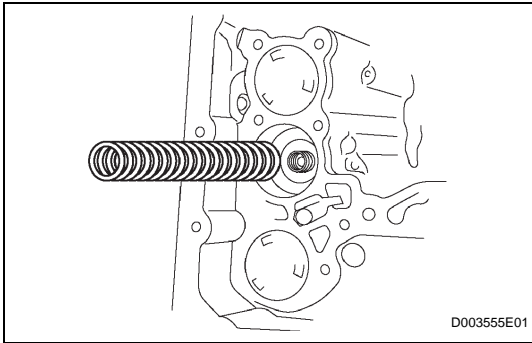
**16. REMOVE BRAKE DRUM GASKET**

- (a) Remove the gasket from the transaxle case.

**17. REMOVE CHECK BALL BODY**

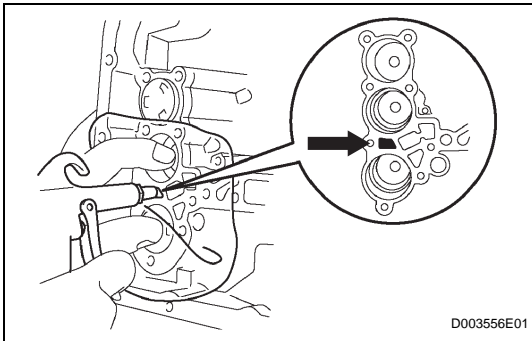
- (a) Remove the check ball body and spring from the transaxle case.

AX



## 18. REMOVE C-3 ACCUMULATOR PISTON

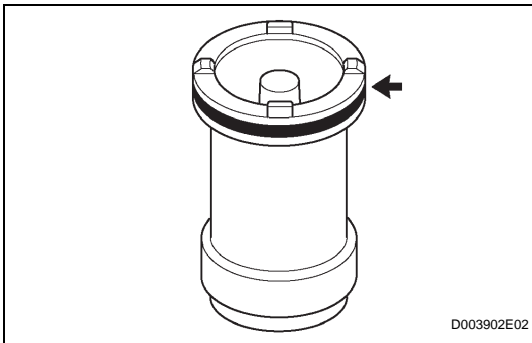
- (a) Remove the spring from the C-3 accumulator piston.



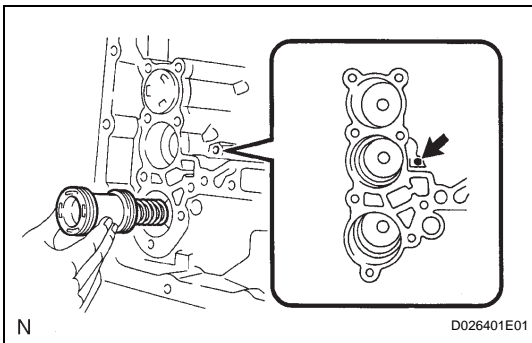
- (b) Apply compressed air (392 kPa, 4.0 kgf/cm<sup>2</sup>, 57 psi) to the oil hole and remove the C-3 accumulator piston.

### NOTICE:

- Applying compressed air may cause the piston to jump out. When removing the piston, hold it using a waste cloth.
- Take care not to splash ATF when applying compressed air.



- (c) Remove the O-ring from the C-3 accumulator piston.

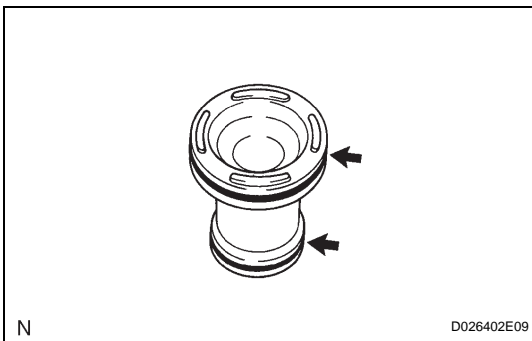


## 19. REMOVE REVERSE CLUTCH ACCUMULATOR PISTON

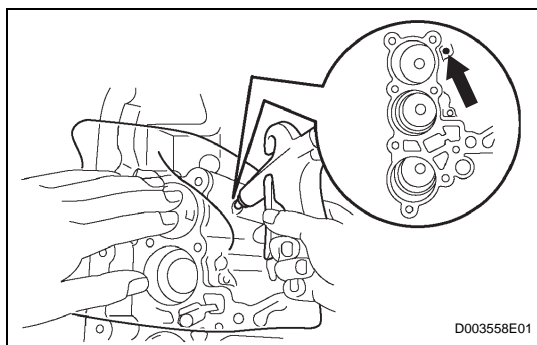
- (a) Apply compressed air (392 kPa, 4.0 kgf/cm<sup>2</sup>, 57 psi) to the oil hole and remove the reverse accumulator piston and spring.

### NOTICE:

- Applying compressed air may cause the piston to jump out. When removing the piston, hold it using a waste cloth.
- Take care not to splash ATF when applying compressed air.



- (b) Remove the 2 O-rings from the reverse clutch accumulator piston.



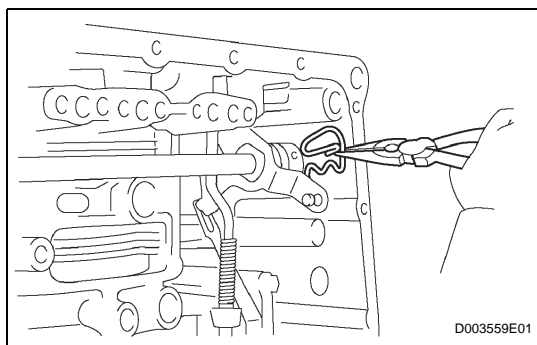
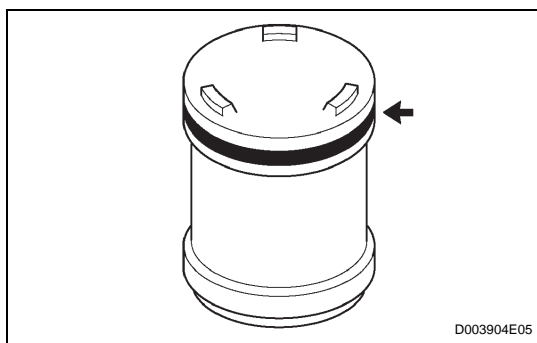
## 20. REMOVE B-3 ACCUMULATOR PISTON

- (a) Apply compressed air (392 kPa, 4.0 kgf/cm<sup>2</sup>, 57 psi) to the oil hole and remove the B-3 accumulator piston and 2 springs.

### NOTICE:

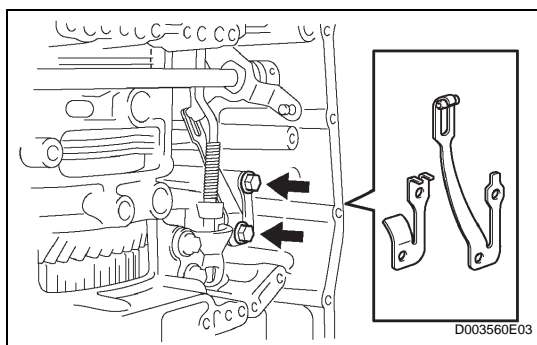
- Applying compressed air may cause the piston to jump out. When removing the piston, hold it using a waste cloth.
- Take care not to splash ATF when applying compressed air.

- (b) Remove the O-ring from the B-3 accumulator piston.



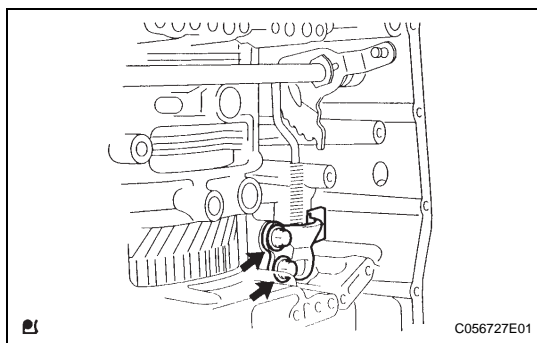
## 21. REMOVE MANUAL VALVE LEVER SHAFT RETAINER SPRING

- (a) Using needle-nose pliers, remove the manual valve lever shaft retainer spring.



## 22. REMOVE MANUAL DETENT SPRING SUB-ASSEMBLY

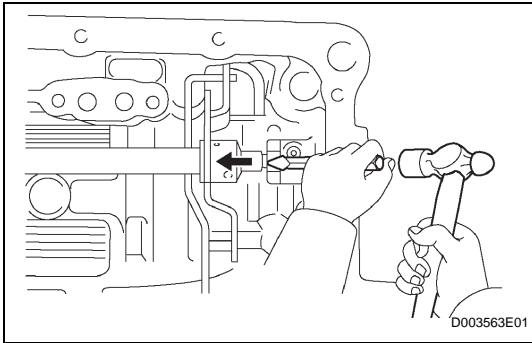
- (a) Remove the 2 bolts, manual detent spring and cover.



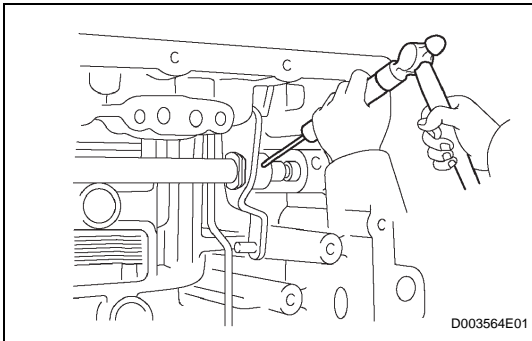
## 23. REMOVE PARKING LOCK PAWL BRACKET

- (a) Remove the 2 bolts and parking lock pawl bracket.

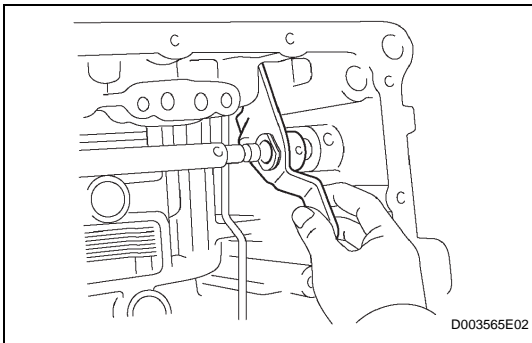
AX



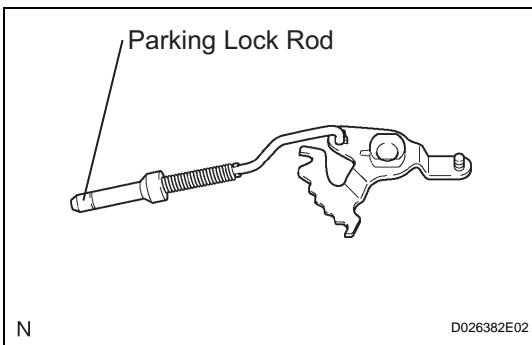
- 24. REMOVE MANUAL VALVE LEVER SUB-ASSEMBLY**  
 (a) Using a chisel and hammer, cut off and remove the spacer.



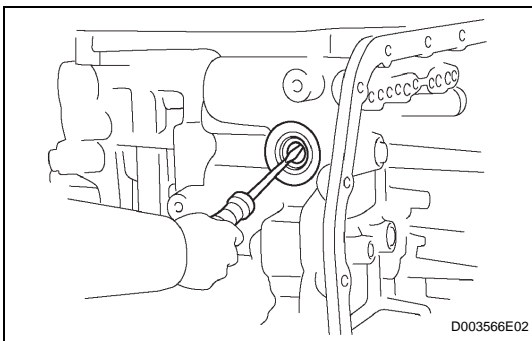
- (b) Using a pin punch ( $\phi 35$  mm) and hammer, drive out the pin.  
**HINT:**  
 Slowly drive out the pin so that it does not fall into the transaxle case.



- (c) Remove the manual valve lever shaft and manual valve lever.



- 25. REMOVE PARKING LOCK ROD SUB-ASSEMBLY**  
 (a) Remove the parking lock rod from the manual valve lever.

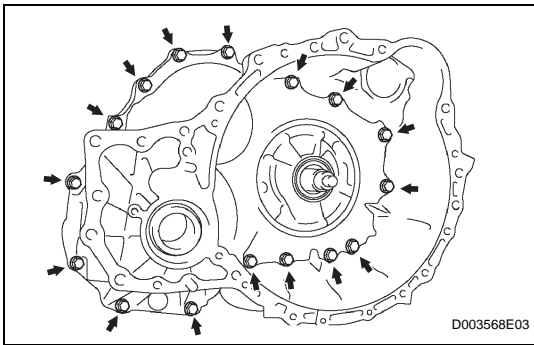


- 26. REMOVE MANUAL VALVE LEVER SHAFT OIL SEAL**  
 (a) Using a screwdriver, pry out the oil seal from the transaxle case.  
**NOTICE:**  
 Do not apply excessive force when removing the oil seal.

- 27. FIX AUTOMATIC TRANSAXLE ASSEMBLY**  
 (a) Fix the transaxle case in place with the oil pump side facing up.

- 28. INSPECT INPUT SHAFT ENDPLAY** (See page [AX-213](#))

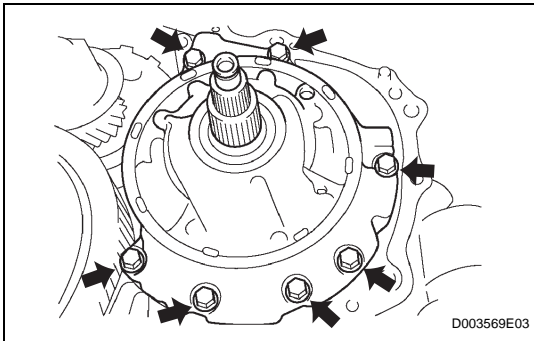


**29. REMOVE TRANSAXLE HOUSING**

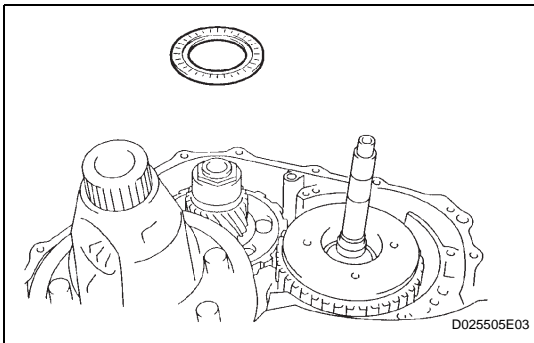
- (a) Remove the 16 bolts.
- (b) Tap on the circumference of the transaxle housing with a plastic-faced hammer to remove the transaxle housing from the transaxle case.

**NOTICE:**

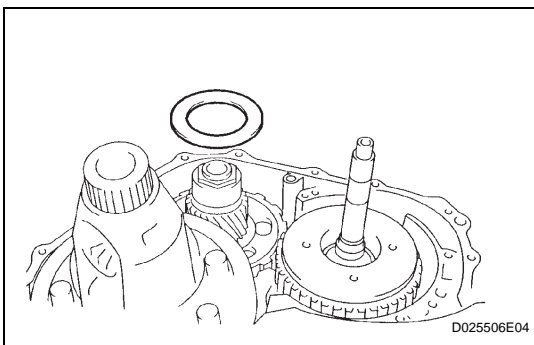
The differential may be accidentally removed when the transaxle housing is removed.

**30. REMOVE OIL PUMP ASSEMBLY**

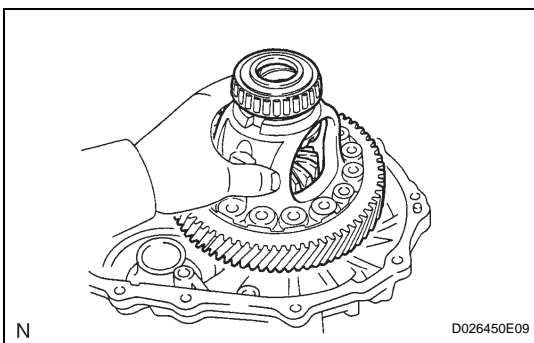
- (a) Remove the 7 bolts and oil pump from the transaxle case.

**31. REMOVE THRUST NEEDLE ROLLER BEARING**

- (a) Remove the thrust needle roller bearing from the underdrive planetary gear.

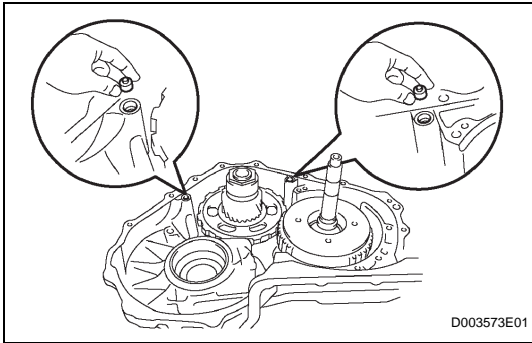
**32. REMOVE NO. 2 THRUST BEARING UNDERDRIVE RACE**

- (a) Remove the thrust bearing race from the underdrive planetary gear.

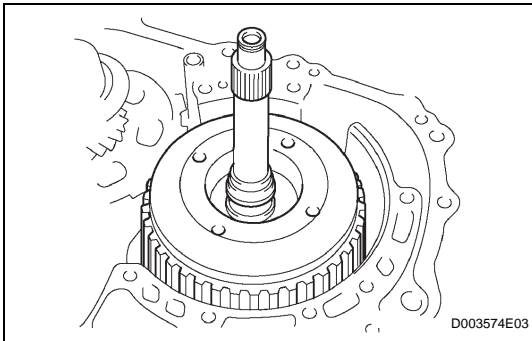
**33. REMOVE DIFFERENTIAL GEAR ASSEMBLY**

- (a) Remove the differential gear from the transaxle case.

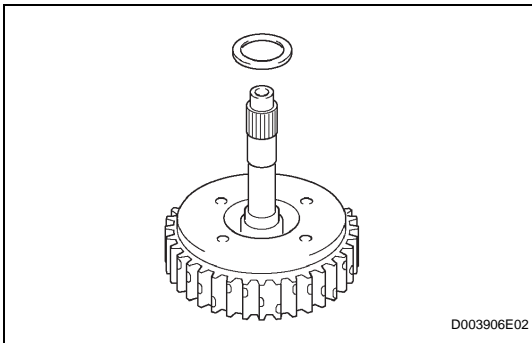
AX

**34. REMOVE OVERDRIVE BRAKE GASKET**

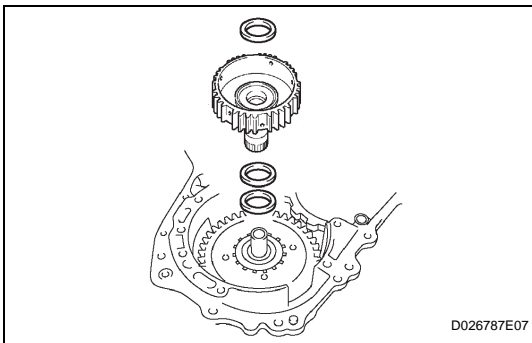
- (a) Remove the 2 overdrive brake gaskets from the transaxle case.

**35. REMOVE FORWARD CLUTCH ASSEMBLY**

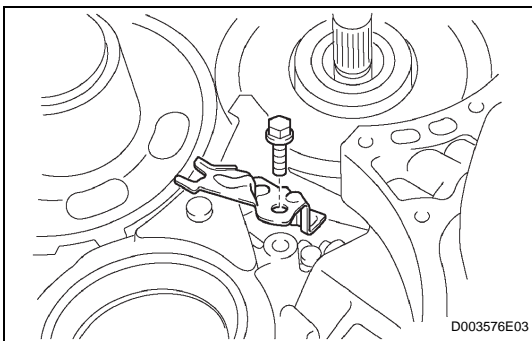
- (a) Remove the forward clutch from the transaxle case.



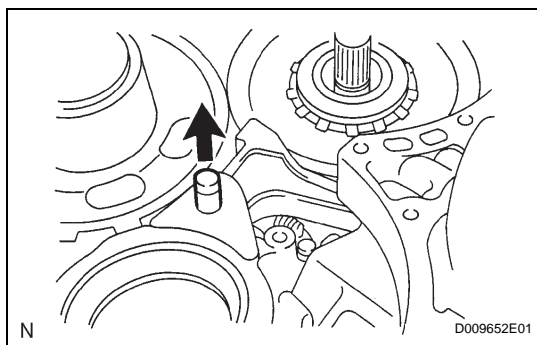
- (b) Remove the thrust needle roller bearing from the forward clutch.

**36. REMOVE MULTIPLE DISC CLUTCH HUB**

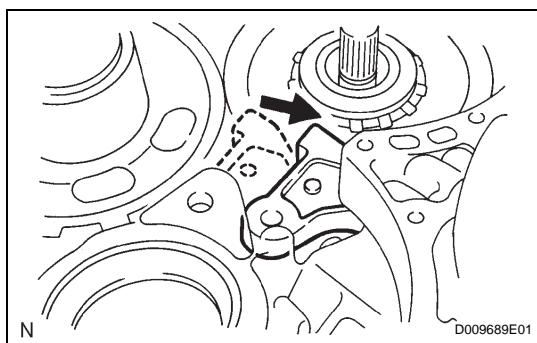
- (a) Remove the thrust needle roller bearing, multiple disc clutch hub, thrust needle roller bearing and No. 1 thrust bearing race from the transaxle case.

**37. INSPECT MULTIPLE DISC CLUTCH HUB (See page [AX-210](#))****38. REMOVE UNDERDRIVE PLANETARY GEAR ASSEMBLY**

- (a) Remove the bolt and pawl shaft clamp.



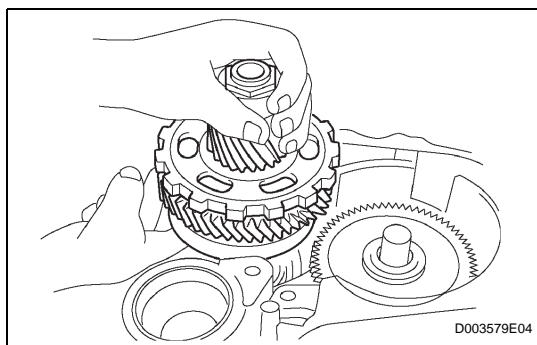
- (b) Remove the parking lock pawl shaft.



- (c) Push the parking lock pawl.

HINT:

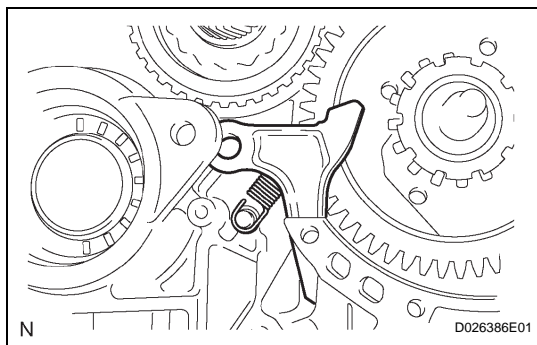
Failure to do so will cause interference when the underdrive planetary gear is removed.



- (d) Remove the underdrive planetary gear from the transaxle case.

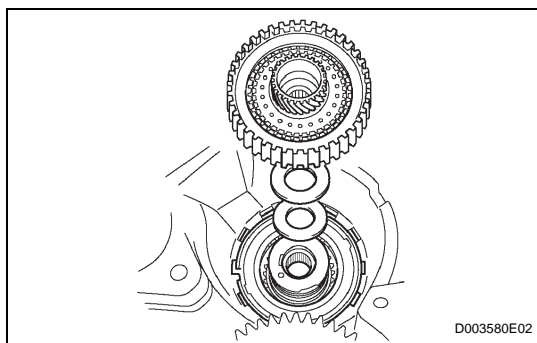
**NOTICE:**

**Make sure that the underdrive planetary gear does not fall out.**



### 39. REMOVE PARKING LOCK PAWL

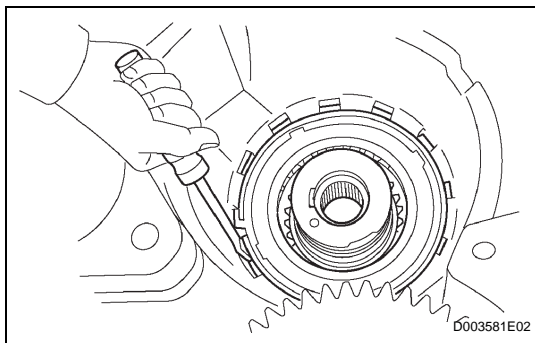
- (a) Remove the spring, pawl pin and parking lock pawl.



### 40. REMOVE UNDERDRIVE CLUTCH ASSEMBLY

- (a) Remove the underdrive clutch, thrust bearing and bearing race from the transaxle case.

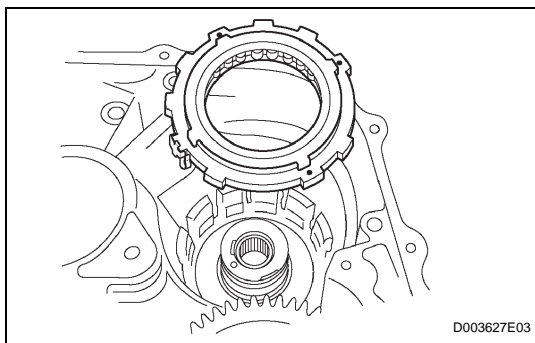
AX

**41. REMOVE UNDERDRIVE 1-WAY CLUTCH ASSEMBLY**

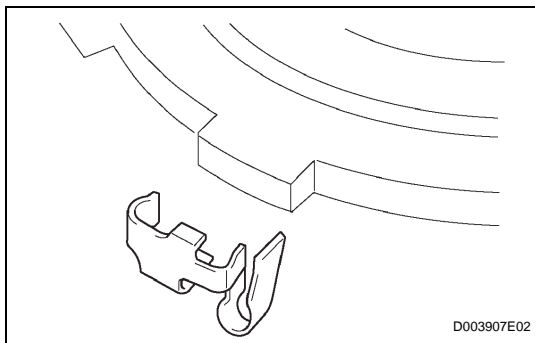
- (a) Using a screwdriver, remove the snap ring from the transaxle case.

**NOTICE:**

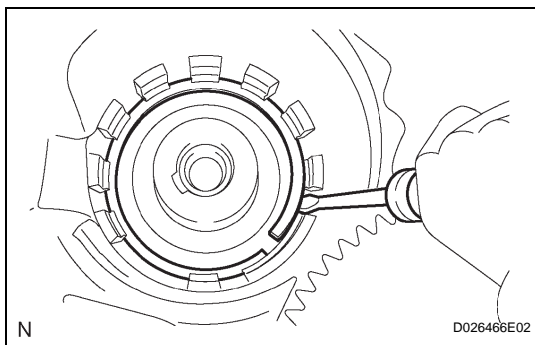
**Do not apply excessive force when removing the snap ring.**



- (b) Remove the underdrive 1-way clutch from the transaxle case.



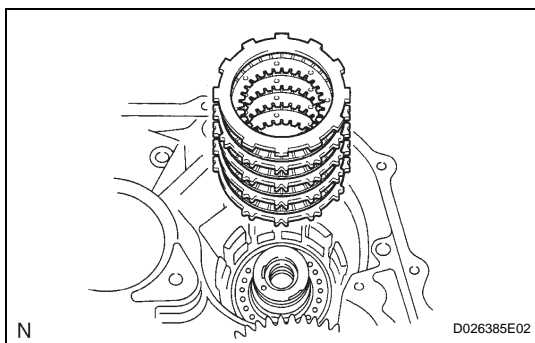
- (c) Remove the outer race retainer from the 1-way clutch.

**42. REMOVE NO. 2 UNDERDRIVE CLUTCH DISC**

- (a) Using a screwdriver, remove the snap ring.

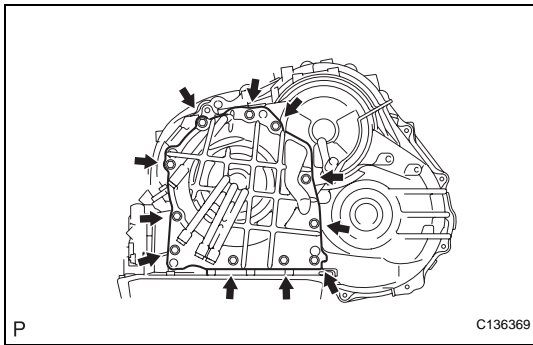
**NOTICE:**

**Do not apply excessive force when removing the snap ring.**



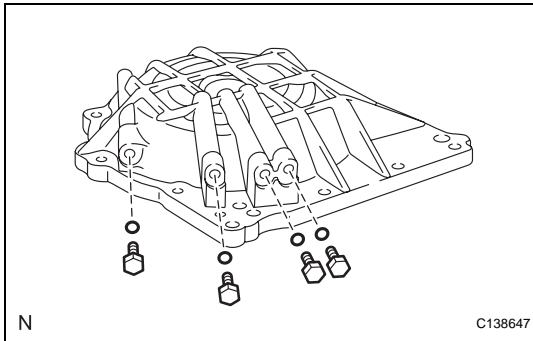
- (b) Remove the flange, 4 discs and 4 plates from the transaxle case.

**43. INSPECT NO. 2 UNDERDRIVE CLUTCH DISC (See page [AX-210](#))**



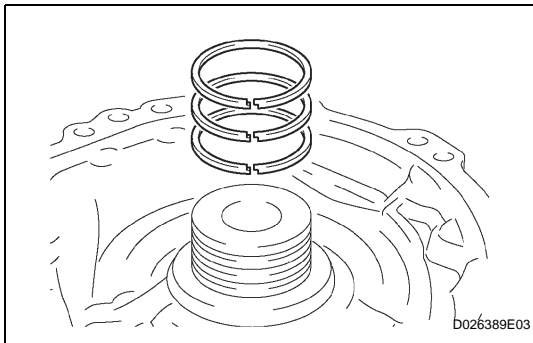
#### 44. REMOVE TRANSAXLE REAR COVER SUB-ASSEMBLY

- (a) Remove the 11 bolts.
- (b) Tap on the circumference of the rear cover with a plastic hammer to remove the transaxle rear cover from the transaxle case.



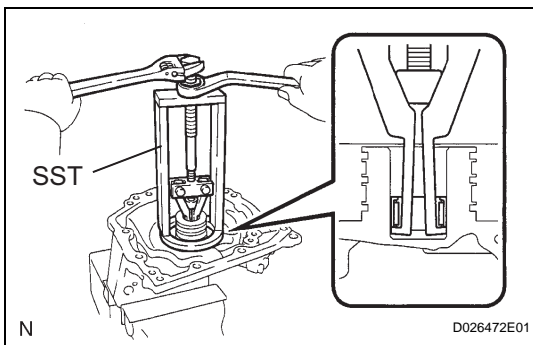
#### 45. REMOVE NO. 1 TRANSAXLE CASE PLUG

- (a) Remove the 4 plugs from the transaxle rear cover.
- (b) Remove the 4 O-rings from the 4 plugs.



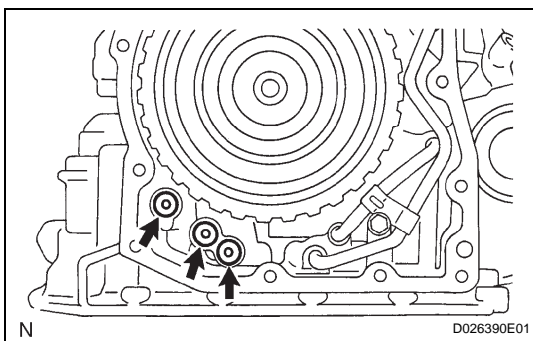
#### 46. REMOVE REAR CLUTCH OIL SEAL RING OUTER

- (a) Remove the 3 rear clutch oil seal rings from the transaxle rear cover.



#### 47. REMOVE NEEDLE ROLLER BEARING

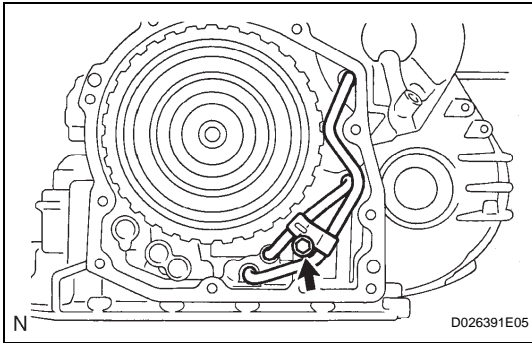
- (a) Using SST, remove the bearing from the transaxle rear cover.  
**SST 09387-00041 (09387-01021, 09387-01030, 09387-01040)**



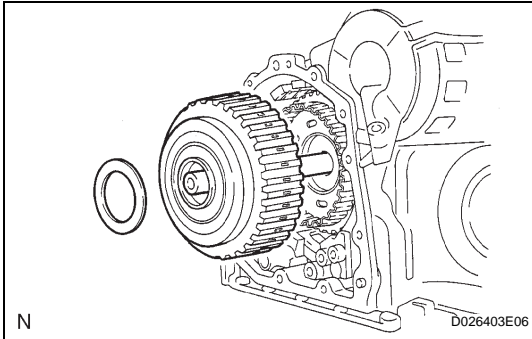
#### 48. REMOVE NO. 1 GOVERNOR APPLY GASKET

- (a) Using a screwdriver, remove the 3 apply gaskets.

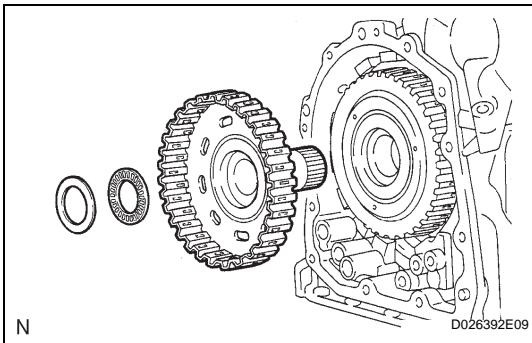
AX

**49. REMOVE BRAKE APPLY TUBE**

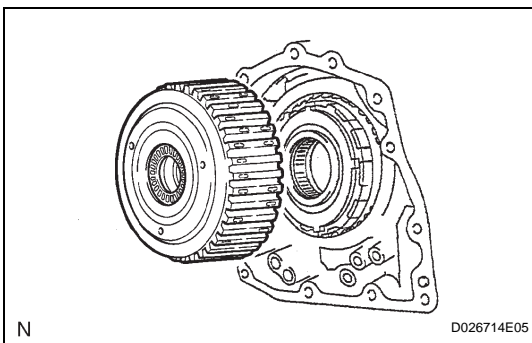
- (a) Remove the bolt, clamp and brake apply tube.
- (b) Remove the clutch apply tube.
- (c) Remove the brake apply tube from the clamp.

**NOTICE:****Do not bend the tubes.****50. REMOVE DIRECT CLUTCH ASSEMBLY**

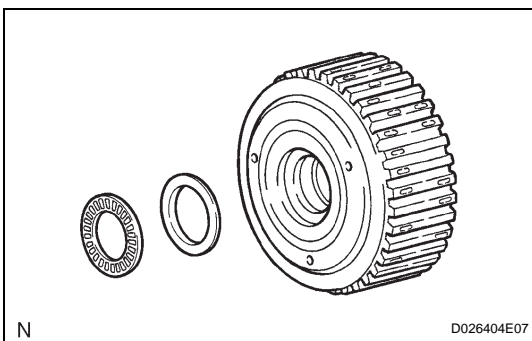
- (a) Remove the thrust bearing and the direct clutch from the transaxle case.

**51. REMOVE OVERDRIVE DIRECT CLUTCH HUB SUB-ASSEMBLY**

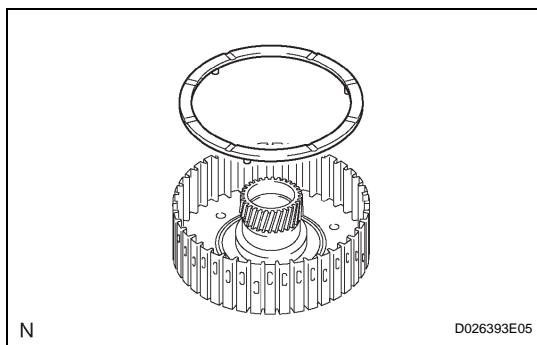
- (a) Remove the thrust bearing race, thrust bearing and overdrive direct clutch hub from the planetary gear.

**52. INSPECT OVERDRIVE DIRECT CLUTCH DRUM SUB-ASSEMBLY (See page [AX-210](#))****53. REMOVE REAR PLANETARY SUN GEAR ASSEMBLY**

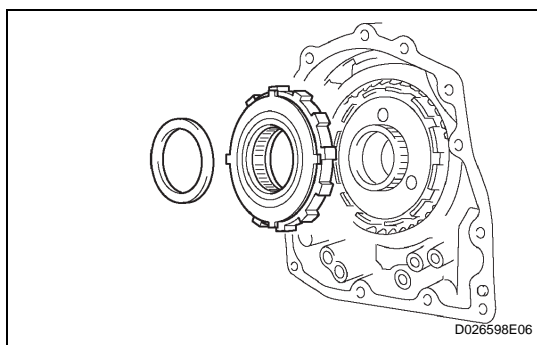
- (a) Remove the rear planetary sun gear from the transaxle case.



- (b) Remove the thrust needle roller bearing and thrust bearing race from the rear planetary sun gear.

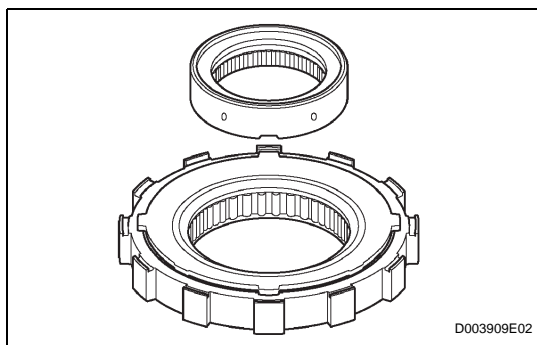


- (c) Remove the planetary carrier thrust washer from the rear planetary sun gear.

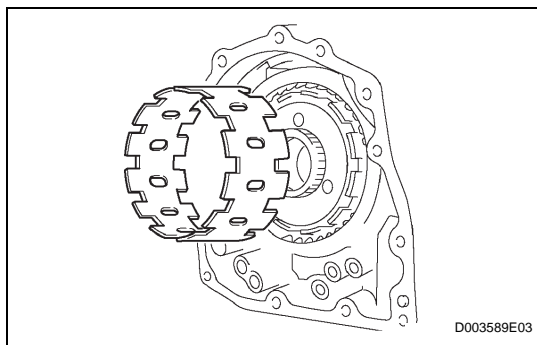


#### 54. REMOVE 1-WAY CLUTCH ASSEMBLY

- (a) Remove the 1-way clutch and thrust needle roller bearing from the transaxle case.

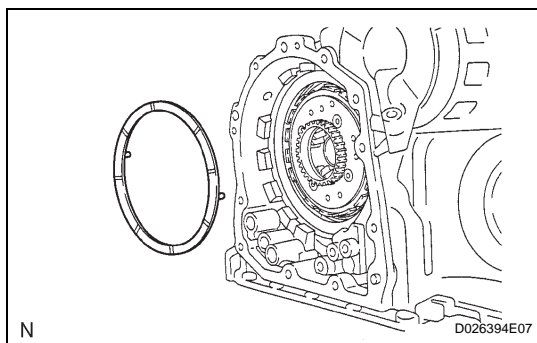


- (b) Remove the 1-way clutch inner race from the 1-way clutch.



#### 55. REMOVE 1-WAY CLUTCH SLEEVE OUTER

- (a) Remove the 1-way clutch sleeve outer from the transaxle case.

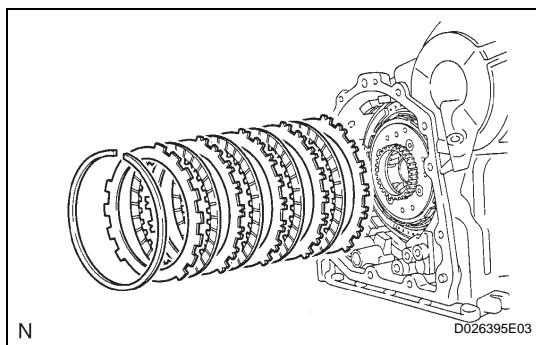


#### 56. REMOVE NO. 1 PLANETARY CARRIER THRUST WASHER

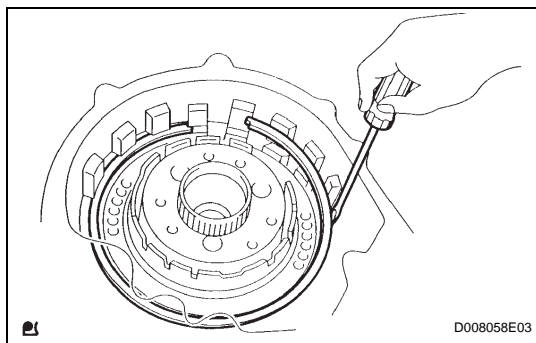
- (a) Remove the planetary carrier thrust washer from the planetary gear.



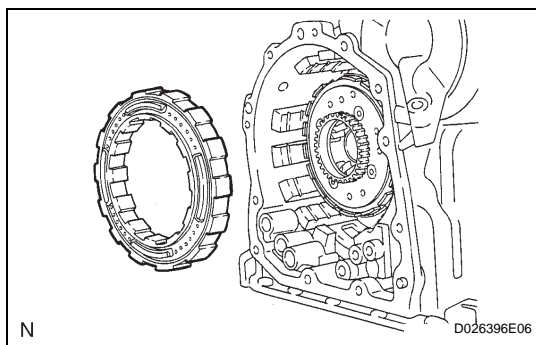
AX

**57. REMOVE 2ND BRAKE CLUTCH DISC**

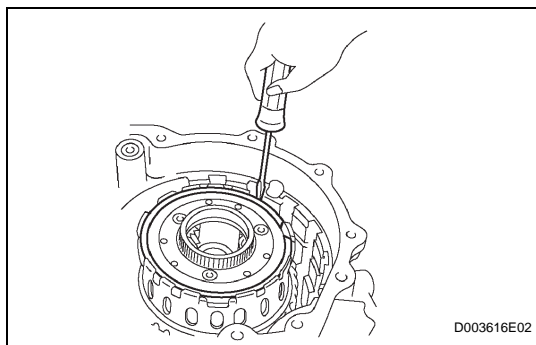
- (a) Using a screwdriver, remove the snap ring.
- (b) Remove the flange, 4 discs and 4 plates from the transaxle case.

**58. INSPECT 2ND BRAKE CLUTCH DISC (See page [AX-211](#))****59. REMOVE 2ND BRAKE PISTON ASSEMBLY**

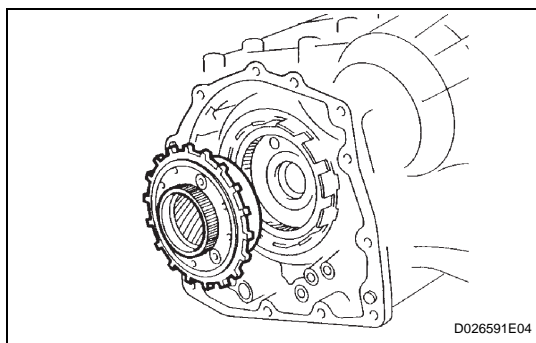
- (a) Using a screwdriver, remove the snap ring.



- (b) Remove the 2nd brake piston from the transaxle case.

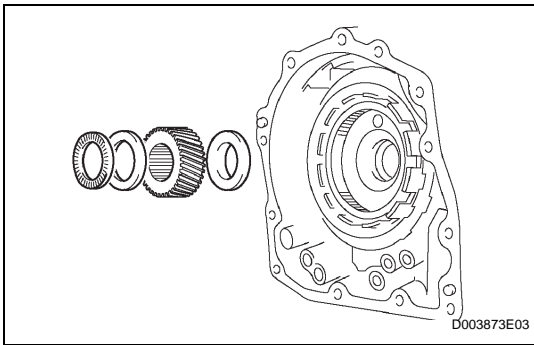
**60. REMOVE REAR PLANETARY GEAR ASSEMBLY**

- (a) Using a screwdriver, remove the snap ring.

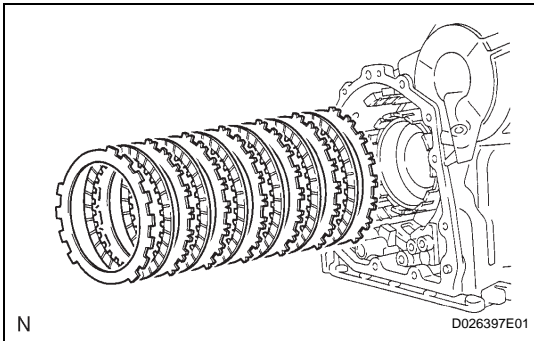


- (b) Remove the rear planetary gear from the transaxle case.



**61. REMOVE INPUT SUN GEAR**

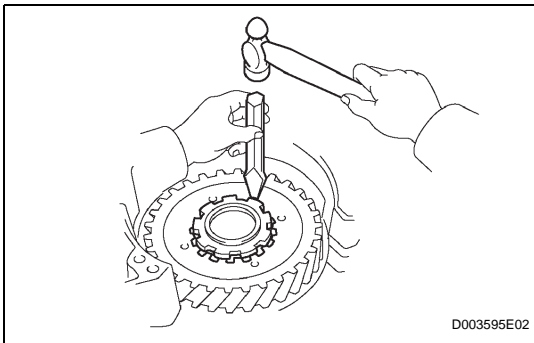
- (a) Remove the 2 thrust needle roller bearings, thrust bearing race and the input sun gear from the transaxle case.

**62. REMOVE 1ST AND REVERSE BRAKE CLUTCH DISC**

- (a) Remove the flange, 6 discs and 6 plates from the transaxle case.

**63. INSPECT 1ST AND REVERSE BRAKE CLUTCH DISC**

(See page [AX-211](#))

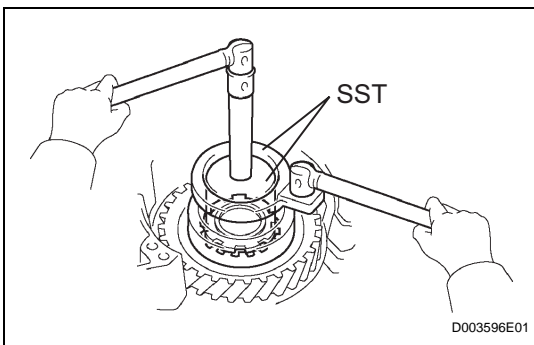
**64. REMOVE FRONT PLANETARY GEAR ASSEMBLY**

- (a) Using a chisel and hammer, unstick the lock washer.

**NOTICE:**

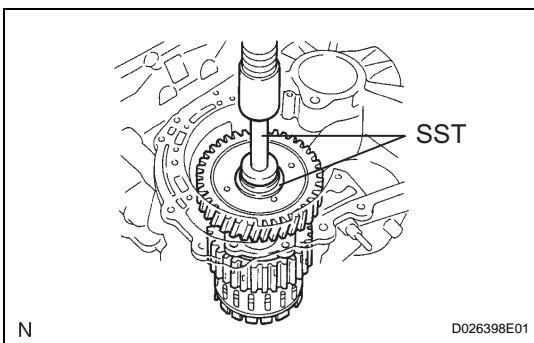
**Push down all the claws of the washer.**

**Otherwise SST cannot be fully pressed against the nut, and cannot loosen the nut.**



- (b) Using SST, remove the nut.

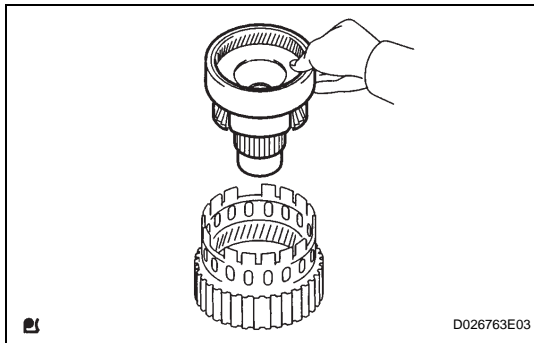
**SST 09387-00030, 09387-00080**



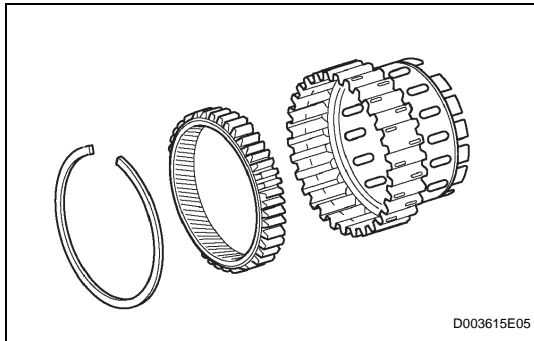
- (c) Using SST and a press, press out the front planetary gear from the counter drive gear.

**SST 09950-60010 (09951-00450), 09950-70010 (09951-07100)**

AX

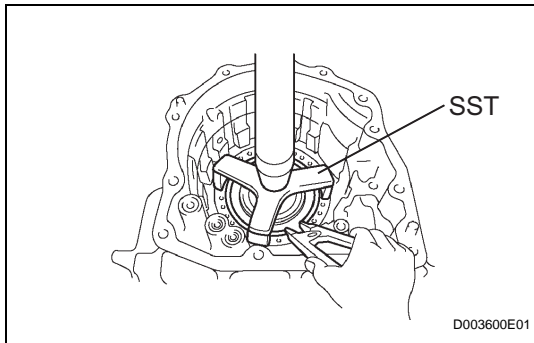


- (d) Remove the front planetary gear from the brake hub.



#### 65. REMOVE FRONT PLANETARY RING GEAR

- (a) Using a screwdriver, remove the snap ring and front planetary ring gear from the brake hub.



#### 66. REMOVE 1ST AND REVERSE BRAKE RETURN SPRING SUB-ASSEMBLY

- (a) Place SST on the return spring, and compress the return spring with a press.

##### NOTICE:

Stop the press when the spring seat is lowered 1 to 2 mm (0.039 to 0.078 in.) from the snap ring groove, to prevent the spring seat from being deformed.

**SST 09387-00070**

- (b) Using a snap ring expander, remove the snap ring.

##### NOTICE:

Do not expand the snap ring excessively.

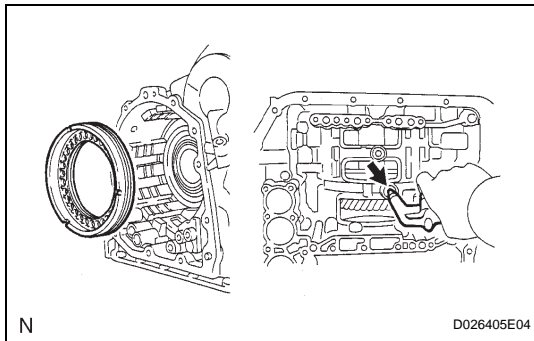
#### 67. INSPECT 1ST AND REVERSE BRAKE RETURN SPRING SUB-ASSEMBLY (See page [AX-211](#))

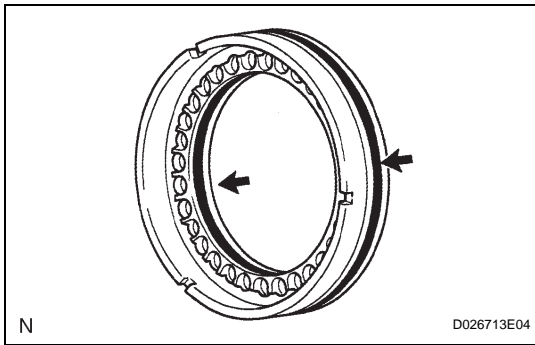
#### 68. REMOVE 1ST AND REVERSE BRAKE PISTON

- (a) Apply compressed air (392 kPa, 4.0 kgf/cm<sup>2</sup>, 57 psi) to the transaxle case to remove the 1st and reverse brake piston.

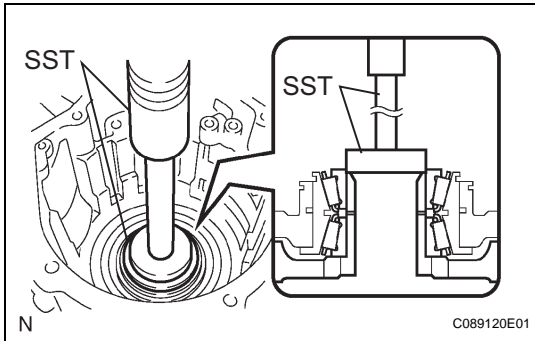
##### NOTICE:

- Applying compressed air may cause the piston to jump out. When removing the piston, hold it using a waste cloth.
- Take care not to splash ATF when applying compressed air.



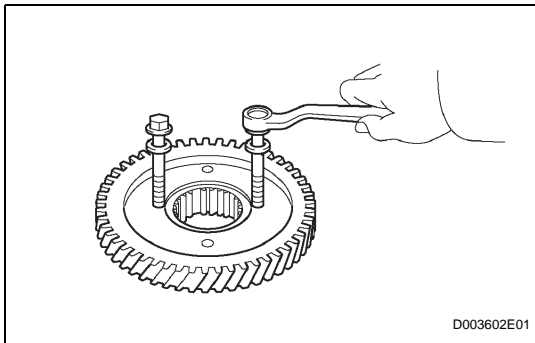


- (b) Remove the 2 O-rings from the 1st and reverse brake piston.

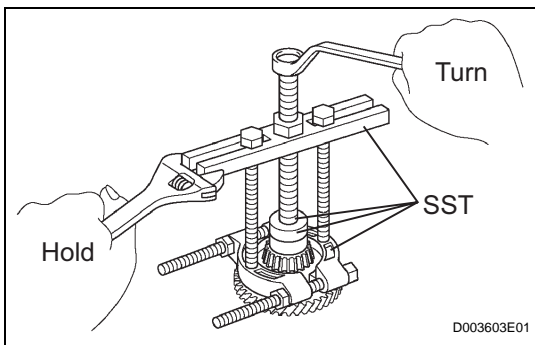


## 69. REMOVE COUNTER DRIVE GEAR

- (a) Using SST and a press, remove the counter drive gear from the transaxle case.  
**SST 09950-60010 (09951-00590), 09950-70010 (09951-07100)**



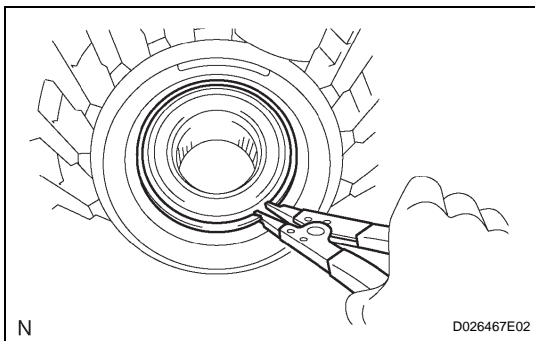
- (b) As shown in the illustration, tighten the 2 bolts evenly and make a clearance of approximately. 20.0 mm (0.787 in.) between the counter drive gear and the inner race.



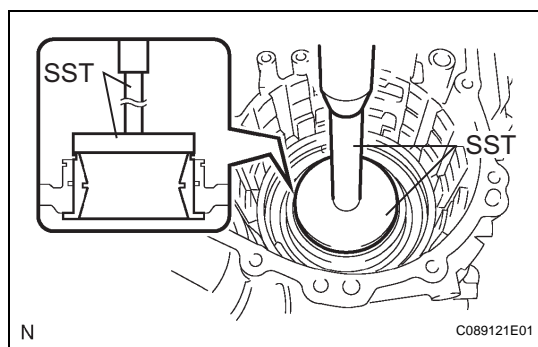
- (c) Using SST, remove the tapered roller bearing.  
**SST 09950-60010 (09951-00590), 09950-00020, 09950-00030, 09950-40011 (09957-04010)**

## 70. REMOVE TRANSFER DRIVEN PINION FRONT BEARING

- (a) Using a snap ring expander, remove the snap ring.



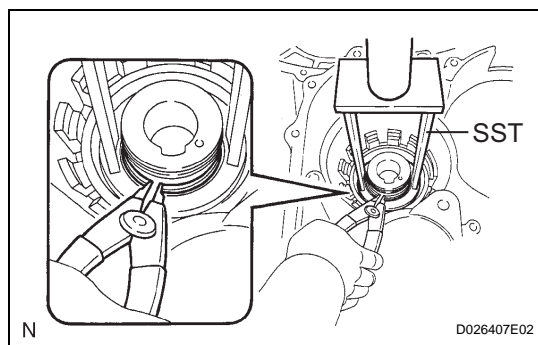
AX



- (b) Using SST and a press, press out the bearing outer race.

**SST 09950-60020 (09951-00910)**

## 71. REMOVE NO. 2 BREATHER PLUG



## 72. REMOVE UNDERDRIVE BRAKE RETURN SPRING SUB-ASSEMBLY

- (a) Place SST on the return spring, and compress the return spring with a press.

### NOTICE:

Stop the press when the spring seat is lowered 1 to 2 mm (0.039 to 0.078 in.) from the snap ring groove to prevent the spring seat from being deformed.

**SST 09387-00020**

- (b) Using a snap ring expander, remove the snap ring.

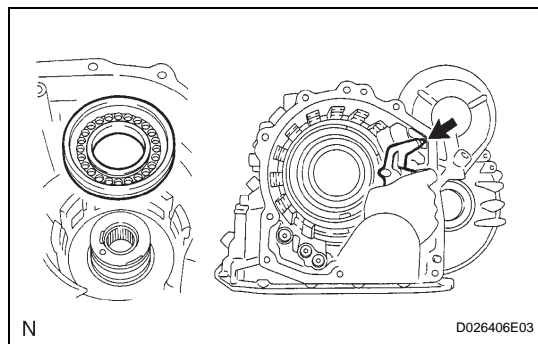
### NOTICE:

Do not expand the snap ring excessively.

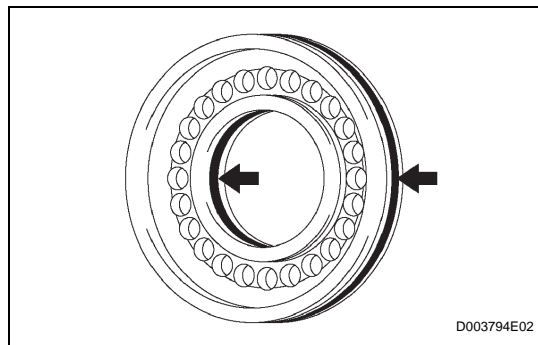
## 73. INSPECT UNDERDRIVE BRAKE RETURN SPRING SUB-ASSEMBLY (See page AX-211)

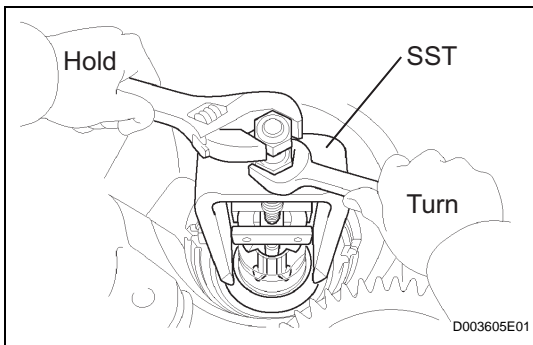
## 74. REMOVE UNDERDRIVE BRAKE PISTON

- (a) Apply compressed air (392 kPa, 4.0 kgf/cm<sup>2</sup>, 57 psi) to the transaxle case to remove the underdrive brake piston.



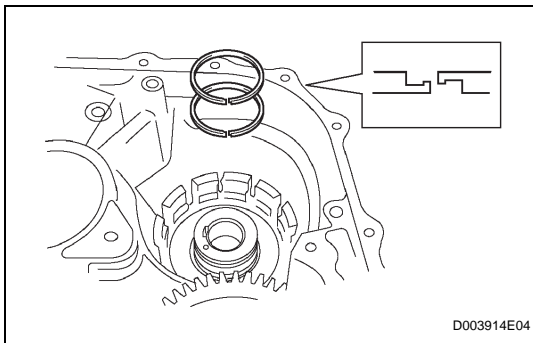
- (b) Remove the 2 O-rings from the underdrive brake piston.



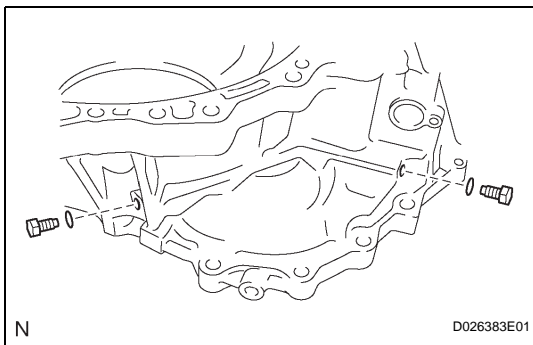
**75. REMOVE NEEDLE ROLLER BEARING**

- (a) Using SST, remove the needle roller bearing from the transaxle case.

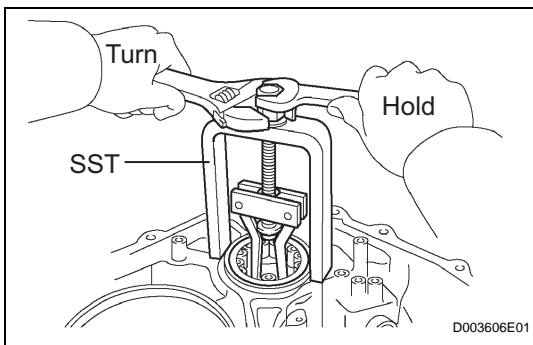
**SST 09387-00041 (09387-01010, 09387-01030, 09387-01040)**

**76. REMOVE UNDERDRIVE CLUTCH DRUM OIL SEAL RING**

- (a) Remove the 2 oil seal rings from the transaxle case.

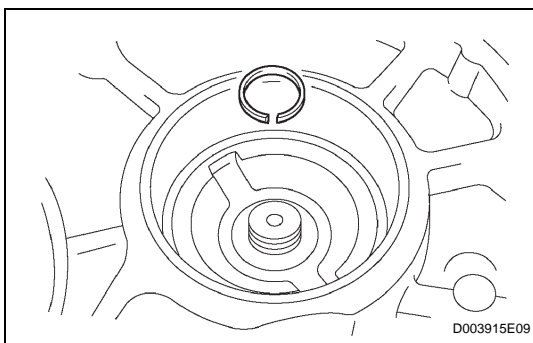
**77. REMOVE NO. 1 TRANSAXLE CASE PLUG**

- (a) Remove the 2 transaxle case plugs.  
(b) Remove the 2 O-rings from the 2 plugs.

**78. REMOVE UNDERDRIVE CYLINDRICAL ROLLER BEARING**

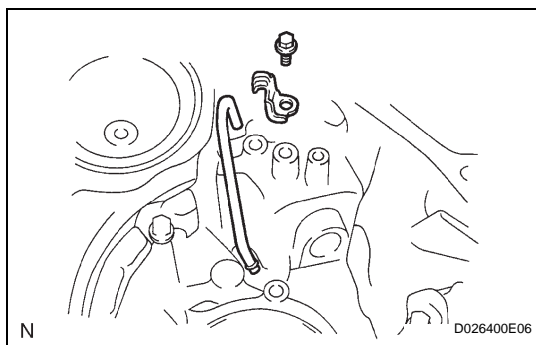
- (a) Using SST, remove the underdrive cylindrical roller bearing from the transaxle case.

**SST 09514-35011**

**79. REMOVE UNDERDRIVE OUTPUT SHAFT OIL SEAL RING**

- (a) Remove the oil seal ring from the transaxle housing.

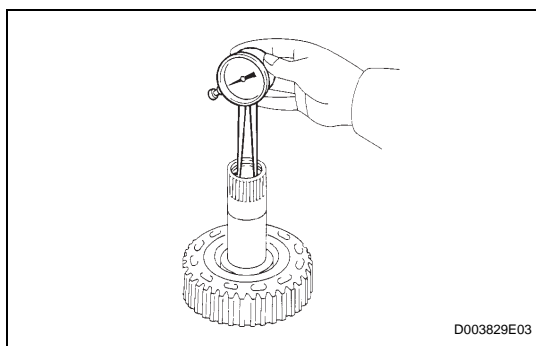
AX

**80. REMOVE DIFFERENTIAL GEAR LUBE APPLY TUBE**

- (a) Remove the bolt, transaxle apply tube clamp and differential gear lube apply tube from the transaxle housing.

**NOTICE:**

**Do not bend the tubes.**

**INSPECTION****1. INSPECT MULTIPLE DISC CLUTCH HUB**

- (a) Using a caliper gauge, measure the inside diameter of the forward clutch hub bushing.

**Standard inside diameter:**

**23.03 to 23.05 mm (0.9067 to 0.9075 in.)**

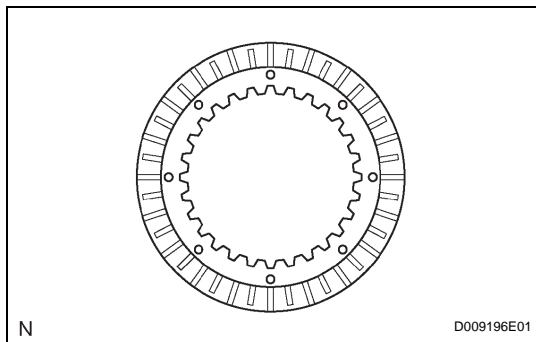
**Maximum inside diameter:**

**23.09 mm (0.9091 in.)**

**NOTICE:**

**Check the contact surface of the bushing in the direct clutch shaft. If any scratch or discoloration is found, replace the direct clutch sub-assembly with a new one.**

If the inside diameter is greater than the maximum, replace the forward clutch hub with a new one.

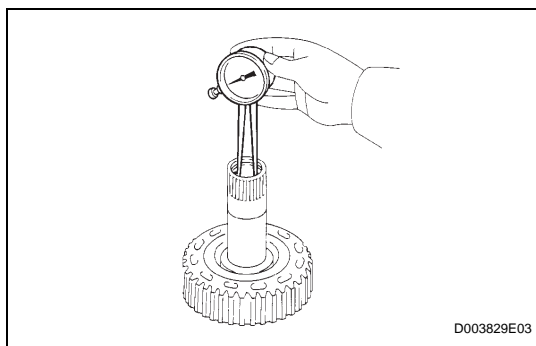
**2. INSPECT NO. 2 UNDERDRIVE CLUTCH DISC**

- (a) Check if the sliding surfaces of the disc, plate and flange are worn or burnt.

If necessary, replace them.

**NOTICE:**

- If the lining of the disc comes off or is discolored, or if a part of the groove is worn, replace the all discs.
- Before installing new discs, immerse them in ATF for at least 15 minutes.

**3. INSPECT OVERDRIVE DIRECT CLUTCH DRUM SUB-ASSEMBLY**

- (a) Using a caliper gauge, measure the inside diameter of the forward clutch hub bushing.

**Standard inside diameter:**

**23.025 to 23.046 mm (0.9065 to 0.9073 in.)**

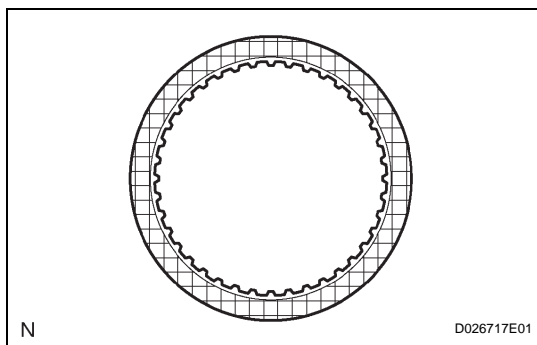
**Maximum inside diameter:**

**23.09 mm (0.9091 in.)**

**NOTICE:**

**Check the contact surface of the bushing in the direct clutch shaft. If any scratch or discoloration is found, replace the direct clutch sub-assembly with a new one.**

If the inside diameter is greater than the maximum, replace the forward clutch hub with a new one.

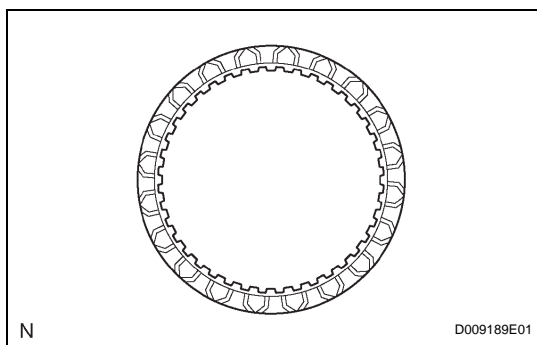


#### 4. INSPECT 2ND BRAKE CLUTCH DISC

- (a) Check if the sliding surface of the disc, plate and flange are worn or burnt.  
If necessary, replace them.

##### NOTICE:

- If the lining of the disc comes off or is discolored, or if a part of the groove is worn, replace all the discs.
- Before installing new discs, immerse them in ATF for at least 15 minutes.

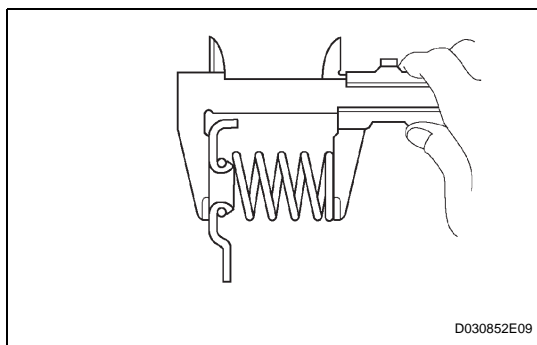


#### 5. INSPECT 1ST AND REVERSE BRAKE CLUTCH DISC

- (a) Check if the sliding surface of the disc, plate and flange are worn or burnt.  
If necessary, replace them.

##### NOTICE:

- If the lining of the disc comes off or is discolored, or if a part of the groove is worn, replace all the discs.
- Before installing new discs, immerse them in ATF for at least 15 minutes.



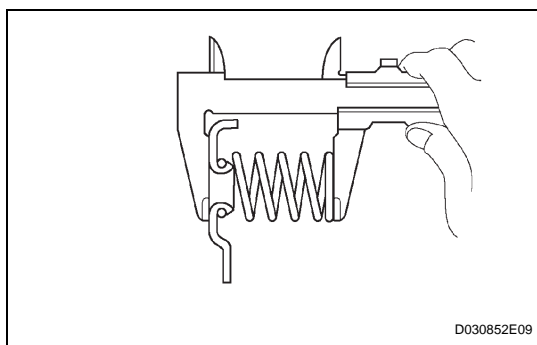
#### 6. INSPECT 1ST AND REVERSE BRAKE RETURN SPRING SUB-ASSEMBLY

- (a) Using a vernier caliper, measure the free length of the spring together with the spring seat.

##### Standard free length:

**17.61 mm (0.6933 in.)**

If the result is not as specified, replace the spring.



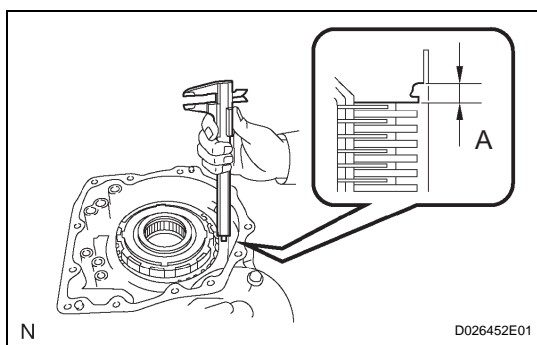
#### 7. INSPECT UNDERDRIVE BRAKE RETURN SPRING SUB-ASSEMBLY

- (a) Using a vernier caliper, measure the free length of the spring together with the spring seat.

##### Standard free length:

**13.24 mm (0.5213 in.)**

If the result is not as specified, replace the spring.



#### 8. INSPECT PACK CLEARANCE OF 1ST AND REVERSE BRAKE

- (a) Using a vernier caliper, measure the distance between the disc surface and the contact surface of the 2nd brake cylinder and transaxle case (Dimension A).
- (b) Select an appropriate flange so that the pack clearance will meet the specified value.

##### Standard pack clearance:

**1.16 to 1.35 mm (0.0457 to 0.0531 in.)**



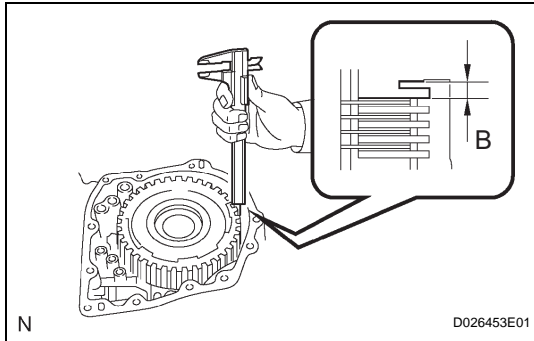
AX

HINT:

Piston stroke = Dimension A - Flange thickness

**Standard flange thickness**

Mark	Thickness	Mark	Thickness
1	1.8 mm (0.071 in.)	5	2.2 mm (0.087 in.)
2	1.9 mm (0.075 in.)	6	2.3 mm (0.091 in.)
3	2.0 mm (0.079 in.)	7	2.4 mm (0.094 in.)
4	2.1 mm (0.083 in.)	8	2.5 mm (0.098 in.)

**9. INSPECT PACK CLEARANCE OF 2ND BRAKE**

- Using a vernier caliper, measure the distance between the disc surface and snap ring surface (Dimension B).
- Select an appropriate flange so that the pack clearance will meet the specified value.

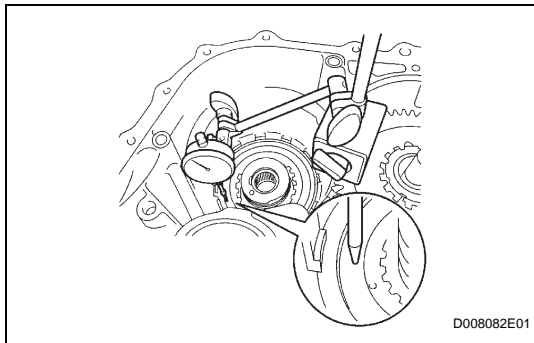
**Standard pack clearance:****0.62 to 0.91 mm (0.0244 to 0.0358 in.)**

HINT:

Piston stroke = Dimension B - Flange thickness - Snap ring thickness 1.6 mm (0.063 in.)

**Standard flange thickness**

Mark	Thickness	Mark	Thickness
1	3.0 mm (0.118 in.)	5	3.4 mm (0.134 in.)
2	3.1 mm (0.122 in.)	6	3.5 mm (0.138 in.)
3	3.2 mm (0.126 in.)	7	3.6 mm (0.142 in.)
4	3.3 mm (0.130 in.)	-	-

**10. INSPECT PACK CLEARANCE OF UNDERDRIVE BRAKE**

- Using a dial indicator, measure the underdrive brake pack clearance while applying and releasing compressed air (392 kPa, 4.0 kgf/cm<sup>2</sup>, 57 psi).

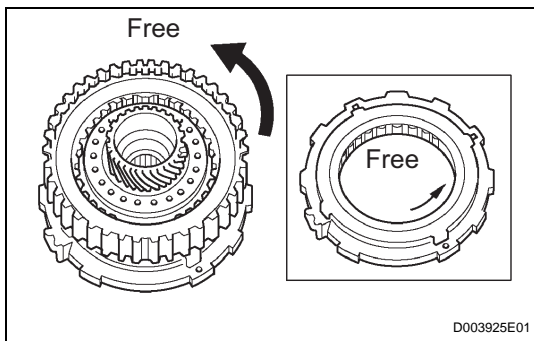
**Standard pack clearance:****1.81 to 2.20 mm (0.0713 to 0.0866 in.)**

HINT:

Select an appropriate flange from the table below so that it will meet the specified value.

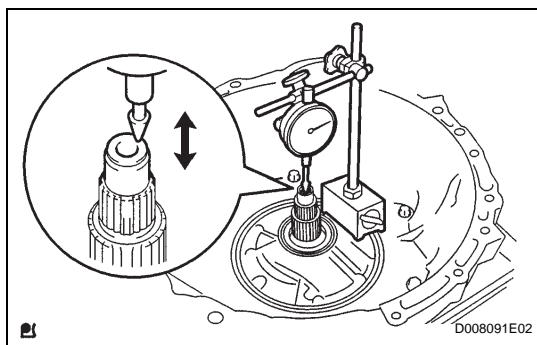
**Standard flange thickness**

Mark	Thickness	Mark	Thickness
1	3.0 mm (0.118 in.)	4	3.1 mm (0.122 in.)
2	3.2 mm (0.126 in.)	5	3.3 mm (0.130 in.)
3	3.4 mm (0.134 in.)	-	-

**11. INSPECT UNDERDRIVE 1-WAY CLUTCH ASSEMBLY**

- Install the underdrive clutch assembly to the 1-way clutch.
- Check that the underdrive 1-way clutch locks when turned clockwise and rotates freely when turned counterclockwise as shown in the illustration. If the result is not as specified, replace the underdrive 1-way clutch.



**12. INSPECT INPUT SHAFT END PLAY**

- (a) Using a dial indicator, measure the input shaft end play.

**Standard end play:**

**0.262 to 1.244 mm (0.01 to 0.049 in.)**

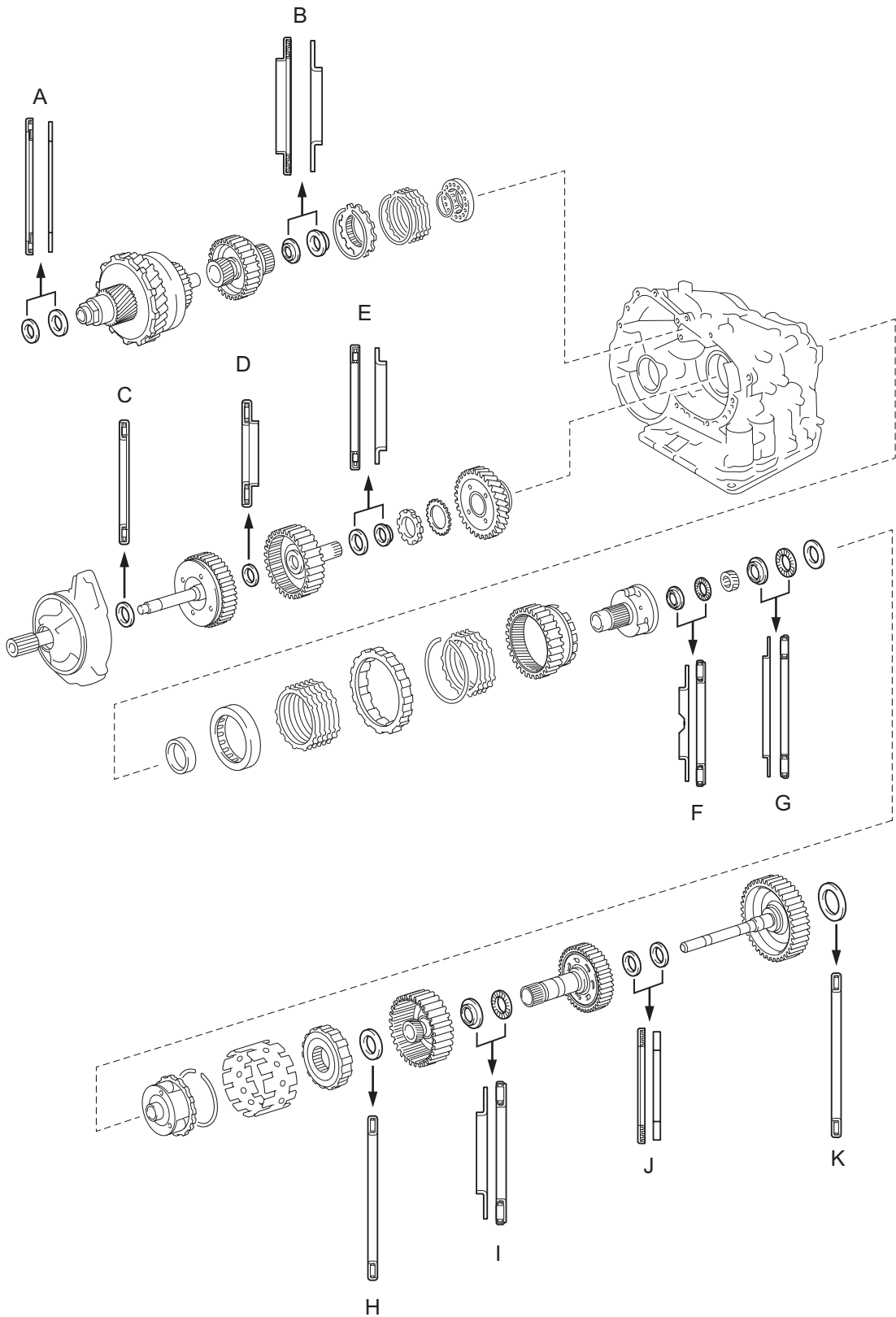
If the result is not as specified, replace the input shaft or thrust needle roller bearing.

**AX**

REASSEMBLY

1. BEARING POSITION

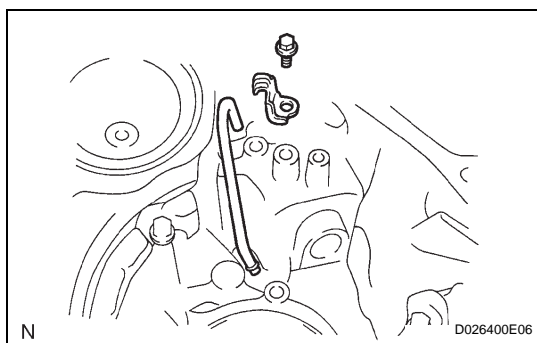
AX



## Standard bearing position

Mark	Front Race Diameter Inside / Outside	Thrust Bearing Diameter Inside / Outside	Rear Race Diameter Inside / Outside
A	-	57.2 mm (2.252 in.) / 84.96 mm (3.3449 in.)	56.4 mm (2.220 in.) / 83.0 mm (3.268 in.)
B	-	37.73 mm (1.4854 in.) / 58.0 mm (2.283 in.)	-
C	-	33.85 mm (1.3327 in.) / 52.2 mm (2.055 in.)	-
D	24.94 mm (0.982 in.)	23.5 mm (0.925 in.) / 44.0mm (1.732 in.)	-
E	-	36.3 mm (1.429 in.) / 51.93 mm (2.0445 in.)	34.5 mm (1.358 in.) / 48.35 mm (1.904 in.)
F	34.35 mm (1.3524 in.) / 56.57 mm (2.2272 in.)	32.45 mm (1.2776 in.) / 56.48 mm (2.2236 in.)	-
G	40.15 mm (1.5807 in.) / 59.25 mm (2.3327 in.)	38.65 mm (1.5217 in.) / 59.79 mm (2.3539 in.)	38.65 mm (1.5217 in.) / 59.25 mm (2.3327 in.)
H	-	53.6 mm (2.110 in.) / 69.6 mm (2.740 in.)	-
I	33.02 mm (1.3000 in.) / 45.8 mm (1.803 in.)	31.85 mm (1.2539 in.) / 57.3 mm (2.256 in.)	-
J	-	24.79 mm (0.9760 in.) / 39.5 mm (1.555 in.)	23.6 mm (0.929 in.) / 37.95 mm (1.4941 in.)
K	-	56.3 mm (2.216 in.) / 75.96 mm (2.9905 in.)	-

AX



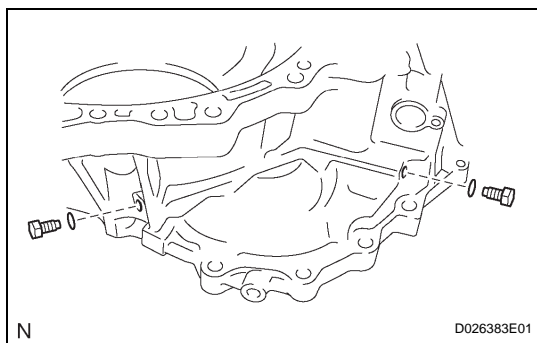
## 2. INSTALL DIFFERENTIAL GEAR LUBE APPLY TUBE

- (a) Install the differential gear lube apply tube and transaxle apply tube clamp to the transaxle housing with the bolt.

**Torque: 9.8 N\*m (100 kgf\*cm, 87 in.\*lbf)**

**NOTICE:**

**Make sure to insert the pipe to the stopper.**

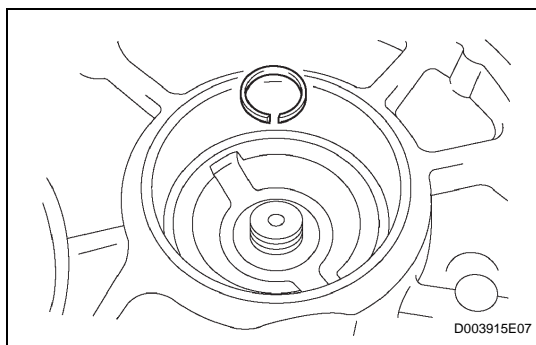


## 3. INSTALL NO. 1 TRANSAXLE CASE PLUG

- (a) Install 2 new O-rings to the 2 plugs.  
(b) Install the 2 plugs to the transaxle rear cover.

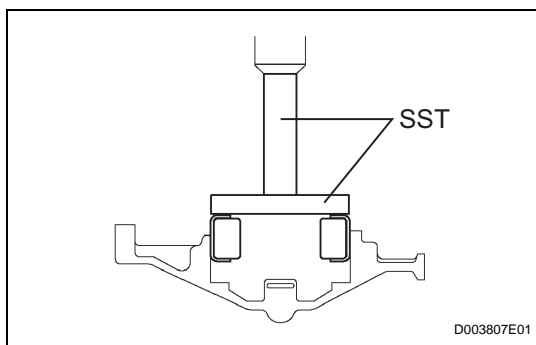
**Torque: 7.4 N\*m (75 kgf\*cm, 65 in.\*lbf)**

AX



#### 4. INSTALL UNDERDRIVE OUTPUT SHAFT OIL SEAL RING

- (a) Coat a new oil seal ring with ATF and install it to the transaxle housing.



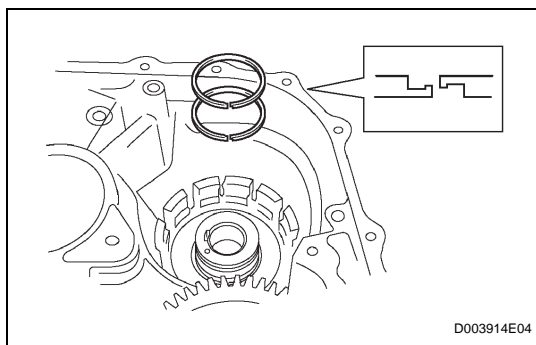
#### 5. INSTALL UNDERDRIVE CYLINDRICAL ROLLER BEARING

- (a) Coat the underdrive cylindrical roller bearing with ATF.
- (b) Using SST and a press, press in the underdrive cylindrical roller bearing.

**SST** 09950-60020 (09951-00810), 09950-70010 (09951-07100)

**NOTICE:**

Do not apply excessive pressure to the bearing.

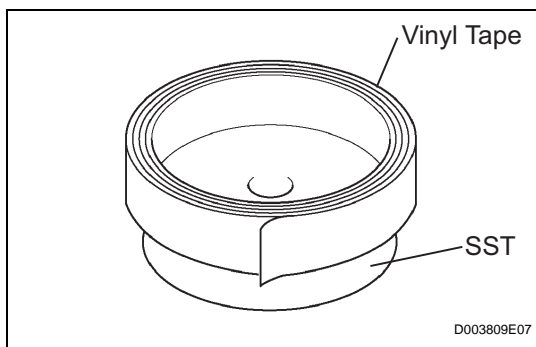


#### 6. INSTALL UNDERDRIVE CLUTCH DRUM OIL SEAL RING

- (a) Coat 2 new oil seal rings with ATF, and install them to the transaxle rear cover.

**NOTICE:**

- Do not expand the end gap of the oil seal ring too much.
- Fix the hooks firmly. Confirm that the oil seal ring rotates freely in its groove.



#### 7. INSTALL NEEDLE ROLLER BEARING

- (a) Wrap vinyl tape around SST 4.0 mm (0.157 in.) from the bottom of SST until the thickness of the tape is about 5.0 mm (0.197 in.).

**SST** 09950-60010 (09951-00320), 09950-70010 (09951-07100)

**NOTICE:**

Clean SST to remove deposited oil before wrapping vinyl tape.

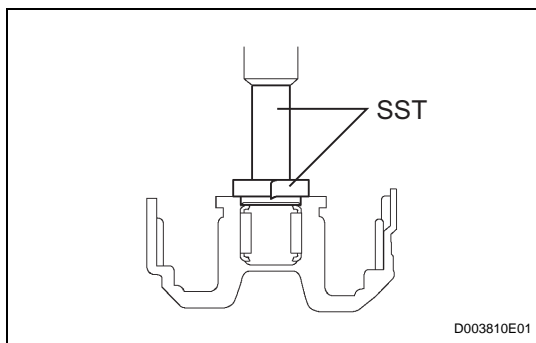
- (b) Coat the needle roller bearing with ATF.

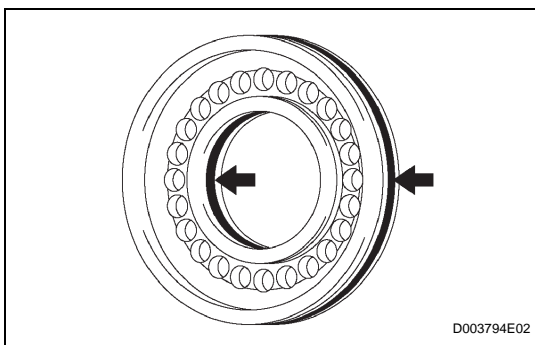
- (c) Using SST and a press, press in the needle-roller bearing to the transaxle case.

**SST** 09950-60010 (09951-00320), 09950-70010 (09951-07100)

**NOTICE:**

When the wrapped vinyl tape contacts the transaxle case, stop press-fitting.





## 8. INSTALL UNDERDRIVE BRAKE PISTON

- (a) Coat 2 new O-rings with ATF, and install them to the underdrive brake piston.

### NOTICE:

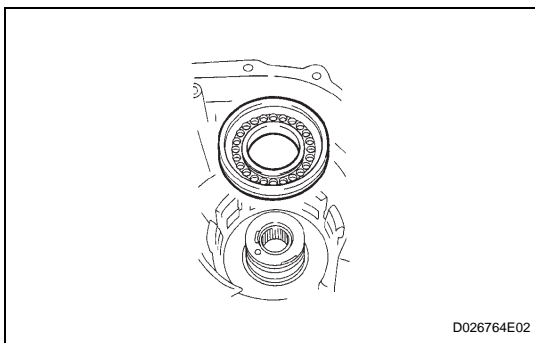
- Make sure that the O-rings are not twisted or pinched when they are installed.
- Apply sufficient ATF to the O-ring before installing.

- (b) Coat the underdrive brake piston with ATF.

- (c) Install the underdrive brake piston to the transaxle case.

### NOTICE:

Be careful not to damage the O-ring.



## 9. INSTALL UNDERDRIVE BRAKE RETURN SPRING SUB-ASSEMBLY

- (a) Place SST on the return spring and compress the return spring with a press.

**SST 09387-00020**

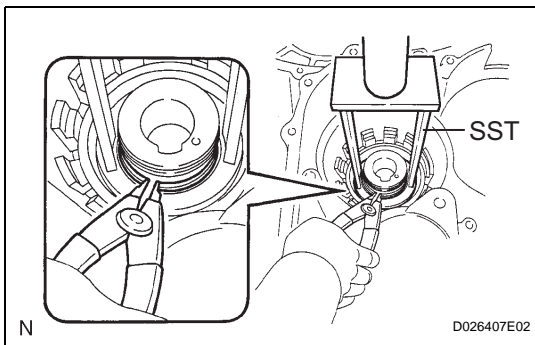
### NOTICE:

- Stop the press when the spring seat is lowered to a position 1 to 2 mm (0.039 to 0.078 in.) from the snap ring groove to prevent the spring seat from being deformed.
- After installing the return spring, check that all the return spring's springs fit in the piston correctly.

- (b) Using a snap ring expander, press in the snap ring to the transaxle case.

### NOTICE:

The snap ring must be fully engaged in the groove of the transaxle case.



## 10. INSTALL NO. 2 BREATHER PLUG

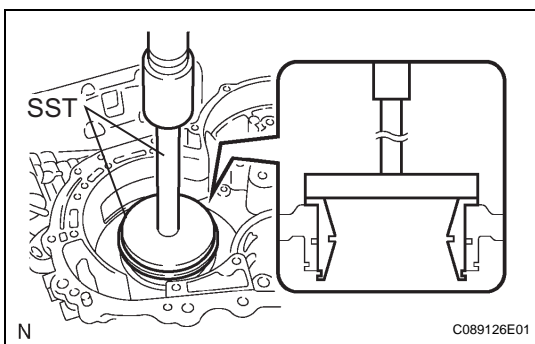
## 11. INSTALL COUNTER DRIVE GEAR BEARING

- (a) Coat the counter drive gear bearing with ATF.  
(b) Using SST and a press, press in the bearing outer race.

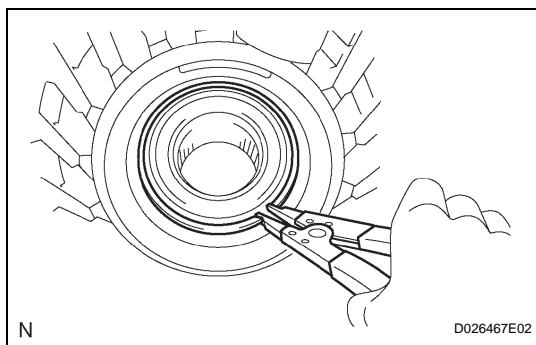
**SST 09950-60020 (09951-01030), 09950-70010 (09951-07150), 09649-17010**

### NOTICE:

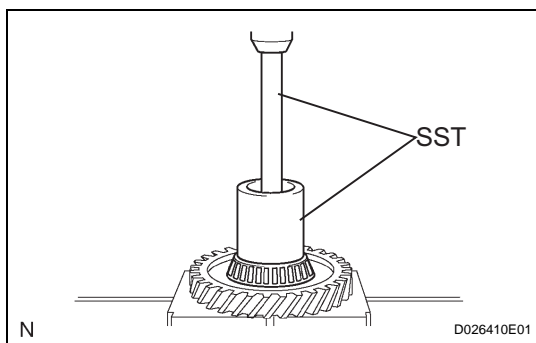
- Do not apply excessive pressure to the bearing.
- Press-fit the bearing outer race until it contacts the transaxle case.



AX

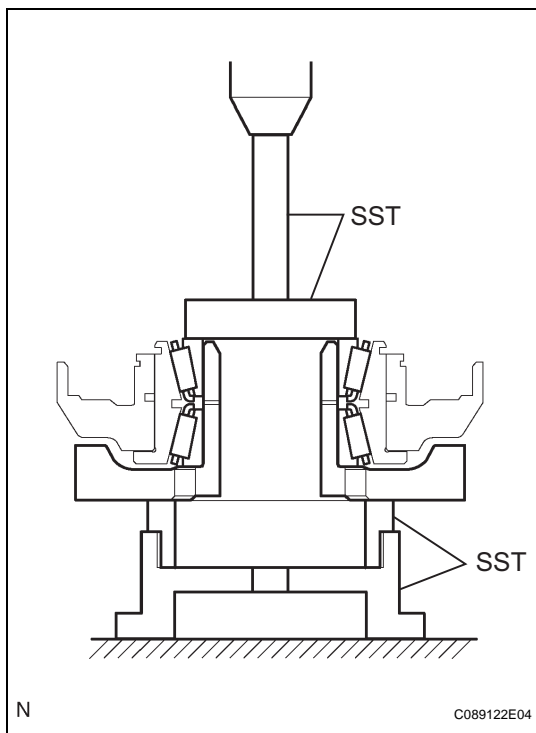


- (c) Using a snap ring expander, install the snap ring.  
**NOTICE:**  
 The white mark side of the snap ring should face upward.

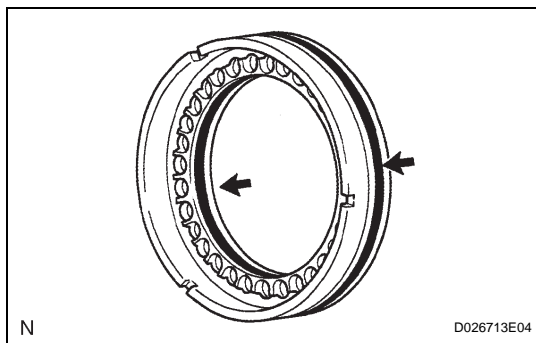


## 12. INSTALL COUNTER DRIVE GEAR

- (a) Coat the counter drive gear with ATF.  
 (b) Using SST and a press, press in the tapered roller bearing to the counter drive gear.  
**SST 09950-70010 (09951-07150), 09649-17010**  
**NOTICE:**  
 Do not apply excessive pressure to the bearing.

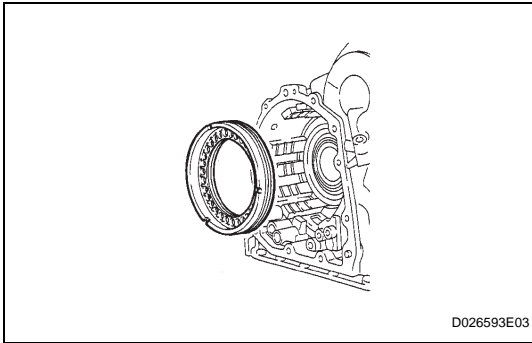


- (c) Using SST and a press, press in the counter drive gear and bearing to the transaxle case.  
**SST 09950-70010 (09951-07150), 09223-15030, 09527-17011, 09950-60020 (09951-00750)**  
**NOTICE:**  
 Do not apply excessive pressure to the counter drive gear.



## 13. INSTALL 1ST AND REVERSE BRAKE PISTON

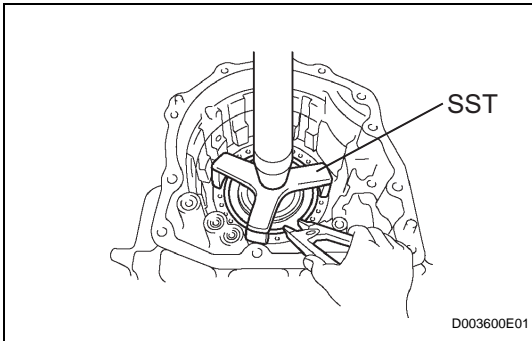
- (a) Coat 2 new O-rings with ATF.  
 (b) Install the 2 O-rings to the 1st and reverse brake piston.  
**NOTICE:**
- Make sure that the O-rings are not twisted or pinched when they are installed.
  - Apply sufficient ATF to the O-ring prior to assembling.



- (c) Coat the 1st and reverse brake piston with ATF, and install it to the transaxle case.

**NOTICE:**

Be careful not to damage the O-ring.



#### 14. INSTALL 1ST AND REVERSE BRAKE RETURN SPRING SUB-ASSEMBLY

- (a) Place SST on the return spring and compress the return spring with a press.

**SST 09387-00070**

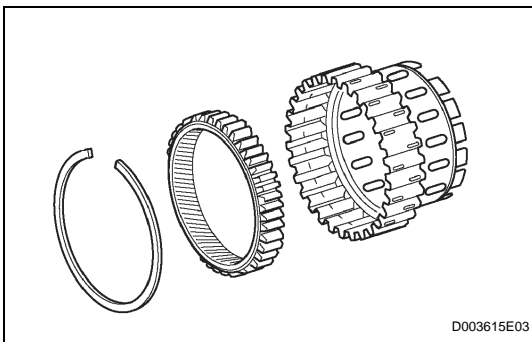
**NOTICE:**

- Stop the press when the spring seat is lowered to a position 1 to 2 mm (0.039 to 0.078 in.) from the snap ring groove to prevent the spring seat from being deformed.
- After installing the return spring, check that all the return spring's springs fit in the piston correctly.

- (b) Using a snap ring expander, press in the snap ring to the transaxle case.

**NOTICE:**

- The snap ring must be fully engaged in the groove of the transaxle case.
- Fix the snap ring to the inside of the claw of the spring seat firmly.

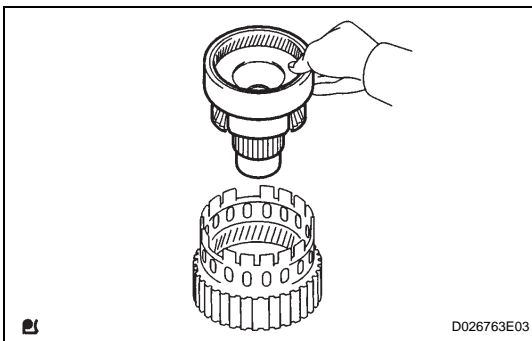


#### 15. INSTALL FRONT PLANETARY RING GEAR

- (a) Using a screwdriver, install the front planetary ring gear and snap ring to the brake hub.

**NOTICE:**

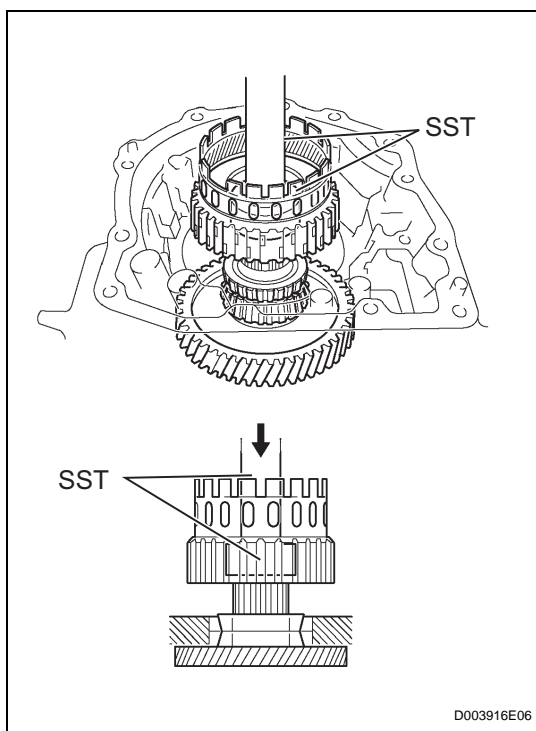
Confirm that the snap ring is engaged in the groove of the brake hub correctly.



#### 16. INSTALL FRONT PLANETARY GEAR ASSEMBLY

- (a) Install the front planetary gear to the brake hub.

AX

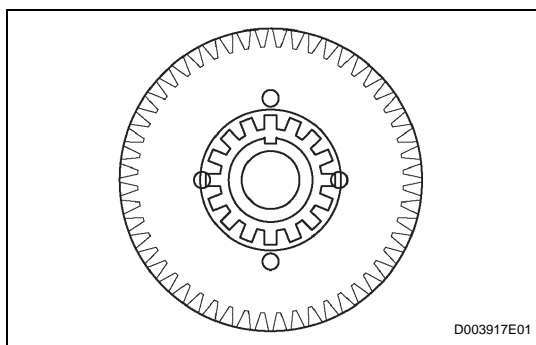


- (b) Using SST and a press, press-fit the front planetary gear.

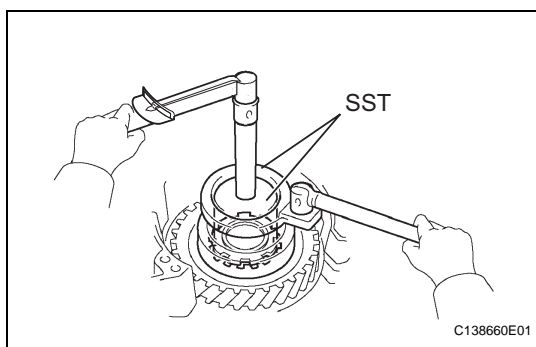
**SST** 09950-60010 (09951-00500), 09950-70010 (09951-07100)

**NOTICE:**

- Do not apply excessive pressure to the planetary gear.
- Press the inner race of the LH tapered roller bearing, counter gear and front planetary gear to the position where no preload should be applied to one pair of tapered roller bearings (left and right).



- (c) Install a new washer as shown in the illustration.



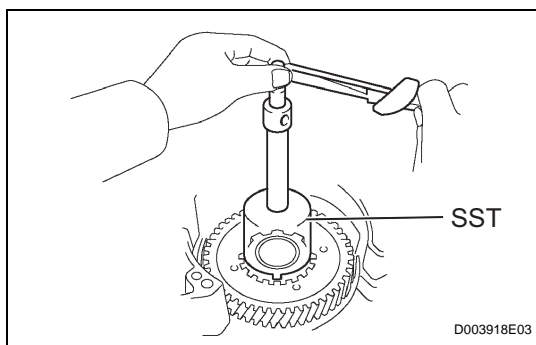
- (d) Using SST, install the nut.

**SST** 09387-00030, 09387-00080

**Torque:** 280 N\*m (3,355 kgf\*cm, 207 ft.\*lbf)

**NOTICE:**

Assemble the washer after pressing each part, then tighten the nut to the standard torque.



- (e) Using SST and a torque wrench, measure the turning torque of the bearing while rotating SST at 60 rpm. When the measured value is not as specified, gradually tighten the nut until it reaches the specified value.

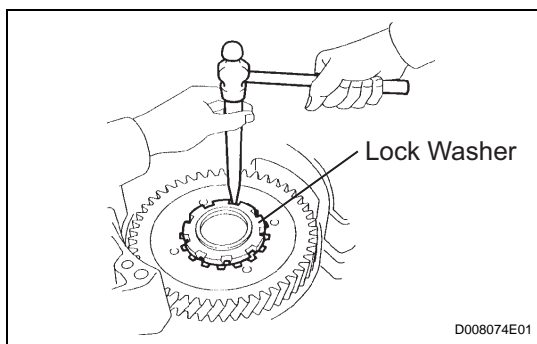
**SST** 09387-00080

**Standard turning torque at 60 rpm:**

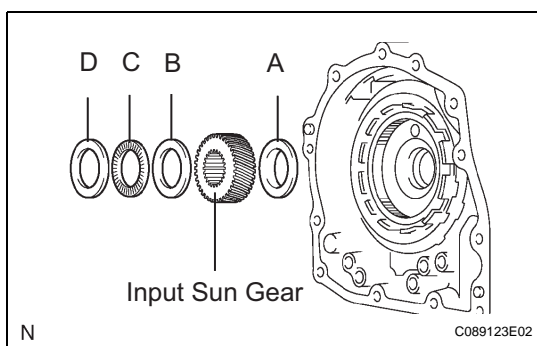
0.51 to 1.02 N\*m (5.1 to 10.0 kgf\*cm, 4.4 to 8.7 in.\*lbf) for new bearing

0.26 to 0.51 N\*m (2.7 to 5.2 kgf\*cm, 2.3 to 4.5 in.\*lbf) for used bearing





- (f) Tighten the nut gradually until the specified turning torque of the tapered roller bearing is measured.  
**Torque: 350 N\*m (3,569 kgf\*cm, 258 ft.\*lbf)**
- (g) Using a chisel and hammer, stake the front lock washer.



## 17. INSTALL INPUT SUN GEAR

- (a) Coat the 2 thrust bearings with ATF.
- (b) Install the 2 thrust bearings, bearing race and input sun gear to the front planetary gear.

### NOTICE:

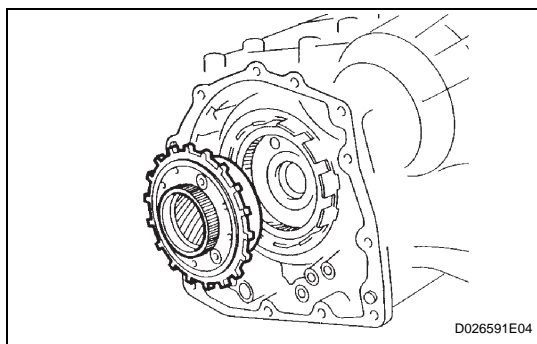
- Install the bearing race on the side of the front planetary carrier. Be careful of the direction of the race.
- When installing the thrust bearing and front sun gears, be careful about the direction of the parts.
- When installing the bearing race on the side of the front sun gear, be careful of the direction of the race.
- Install the thrust bearing and the race after holding the parts on the input sun gear by applying grease. Make sure that the assembling order is correct.

Standard thrust bearing and bearing race diameter

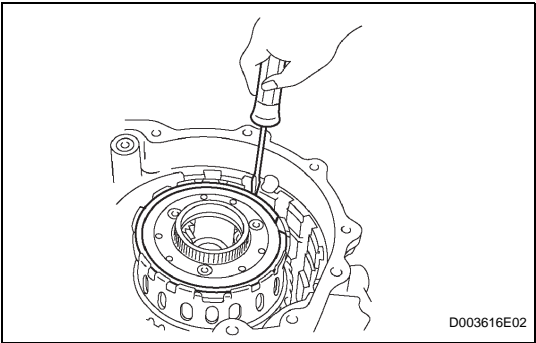
Item	Inside	Outside
Thrust Bearing, A	32.5 mm (1.28 in.)	56.5 mm (2.224 in.)
Thrust Bearing, C	38.6 mm (1.520 in.)	59.7 mm (2.35 in.)
Bearing Race, B	40.2 mm (1.583 in.)	59.3 mm (2.335 in.)
Bearing Race, D	38.6 mm (1.520 in.)	59.3 mm (2.335 in.)

## 18. INSTALL REAR PLANETARY GEAR ASSEMBLY

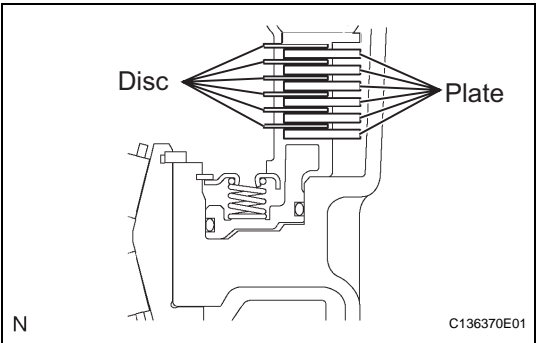
- (a) Install the rear planetary gear to the rear planetary ring gear.



AX

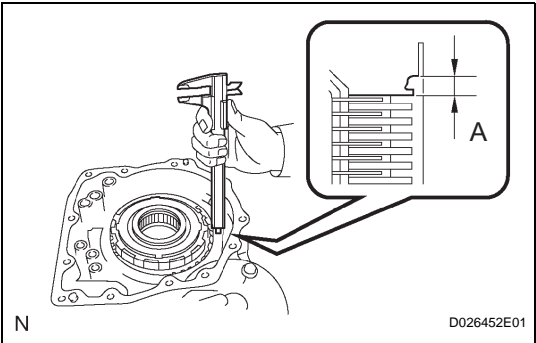


- (b) Using a screwdriver, install the snap ring.  
**NOTICE:**  
Confirm that the snap ring is fixed in the groove of the 1st and reverse brake hub correctly.



**19. INSTALL 1ST AND REVERSE BRAKE CLUTCH DISC**

- (a) Coat the 6 discs with ATF.  
(b) Install the 6 plates and 6 discs.  
**NOTICE:**  
Make sure that the plates and discs are installed as shown in the illustration.



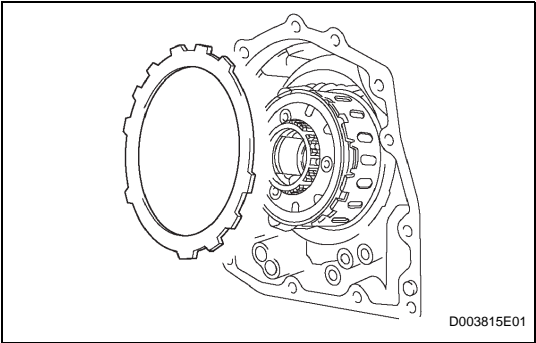
**20. INSPECT PACK CLEARANCE OF FIRST AND REVERSE BRAKE**

- (a) Using a vernier caliper, measure the distance between the disc surface and the contact surface of the 2nd brake cylinder and transaxle case (Dimension A).  
(b) Select an appropriate flange so that the pack clearance will meet the specified value.

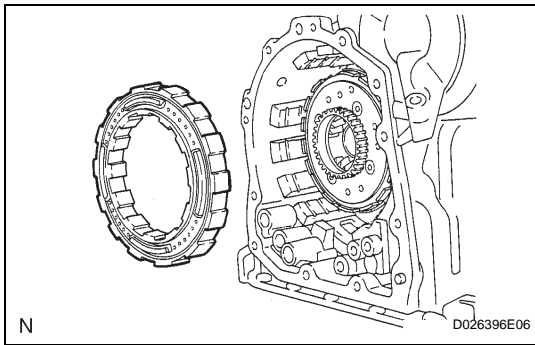
**Standard pack clearance:**  
**1.16 to 1.35 mm (0.0457 to 0.0531 in.)**

**HINT:**  
Piston stroke = Dimension A - Flange thickness  
**Standard flange thickness**

Mark	Thickness	Mark	Thickness
1	1.8 mm (0.071 in.)	5	2.2 mm (0.087 in.)
2	1.9 mm (0.075 in.)	6	2.3 mm (0.091 in.)
3	2.0 mm (0.079 in.)	7	2.4 mm (0.094 in.)
4	2.1 mm (0.083 in.)	8	2.5 mm (0.098 in.)

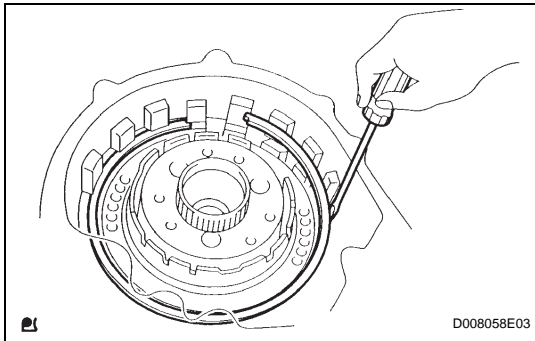


- (c) Install the flange.



## 21. INSTALL SECOND BRAKE PISTON ASSEMBLY

- (a) Install the second brake piston to the transaxle case.



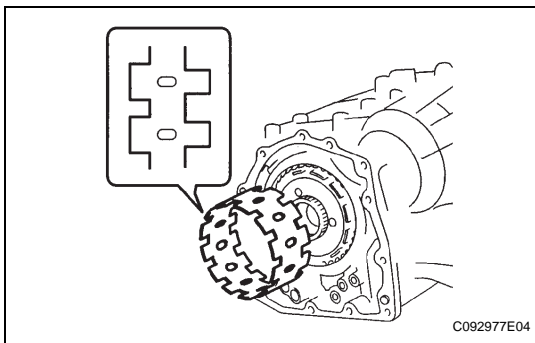
- (b) Install the snap ring and measure the inside diameter.

**Inside diameter:**

**Greater than 167 mm (6.57 in.)**

**NOTICE:**

- Make sure that the taper snap ring is installed in the correct direction.
- When the diameter does not meet the specified value, replace the snap ring with a new one.
- After installing the snap ring, confirm that there is no clearance between the 2nd brake cylinder and the fitting surface of the cylinder in the transaxle case.

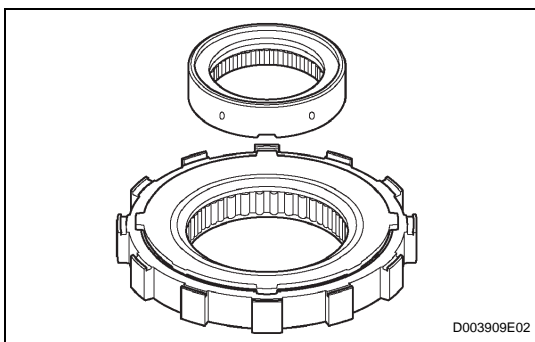


## 22. INSTALL 1-WAY CLUTCH SLEEVE OUTER

- (a) Install the 1-way clutch sleeve outer to the 2nd brake cylinder.

**NOTICE:**

**Make sure that the outer sleeve is installed in the correct direction.**



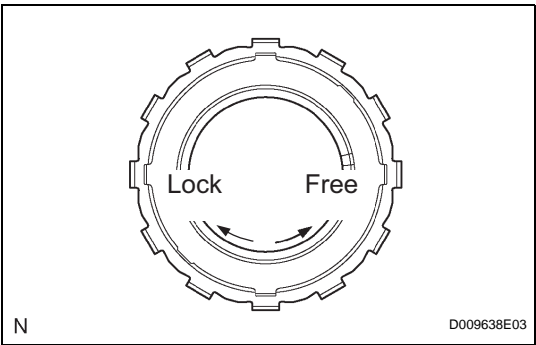
## 23. INSTALL 1-WAY CLUTCH ASSEMBLY

- (a) Install the 1-way clutch inner race to the 1-way clutch.

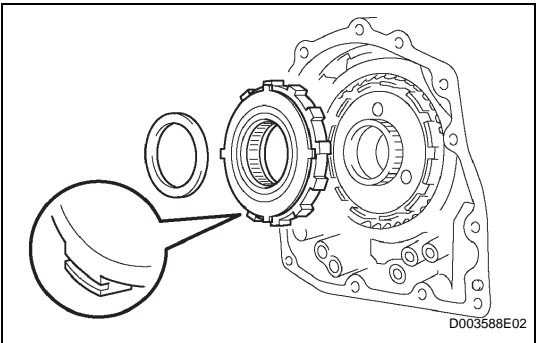
**NOTICE:**

- Make sure that the inner race is installed in the correct direction.
- Confirm that the discrimination mark is visible.

AX



- (b) Check that the 1-way clutch locks when turned clockwise and rotates freely when turned counterclockwise as shown in the illustration..  
HINT:  
If the result is not as specified, replace the 1-way clutch.

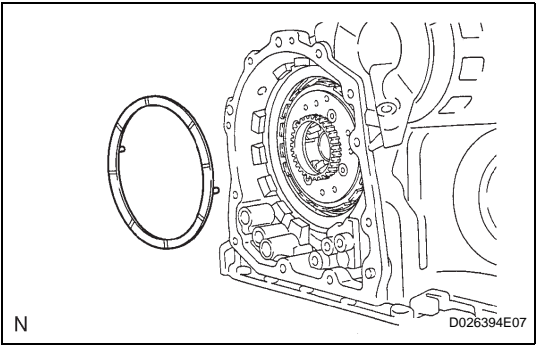


- (c) Install the 1-way clutch and thrust needle roller bearing to the 1-way clutch sleeve outer.

**Standard bearing diameter**

Item	Inside	Outside
Bearing	53.6 mm (2.110 in.)	69.4 mm (2.732 in.)

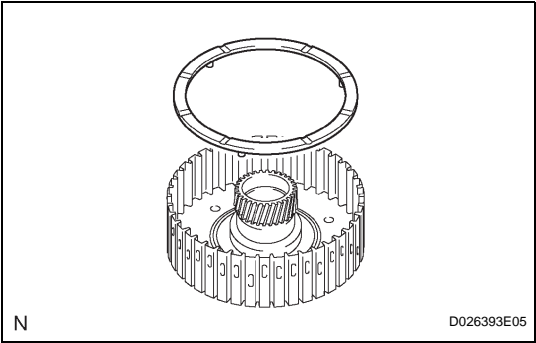
**NOTICE:**  
Install the thrust bearing properly so that the non-colored race will be visible.



**24. INSTALL NO. 1 PLANETARY CARRIER THRUST WASHER**

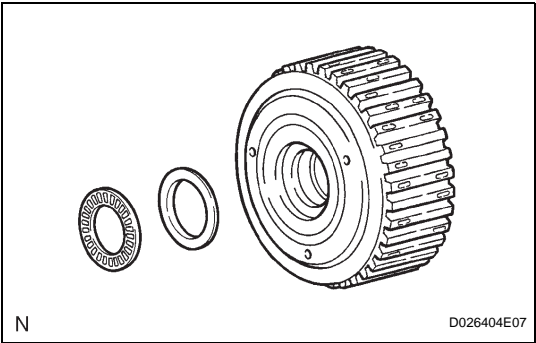
- (a) Coat the planetary carrier thrust washer with yellow petrolatum, and install the washer onto the planetary sun gear.

**NOTICE:**  
After installing the washer, confirm that the projection of the washer is fixed firmly in the hole of the planetary sun gear.



**25. REMOVE REAR PLANETARY SUN GEAR ASSEMBLY**

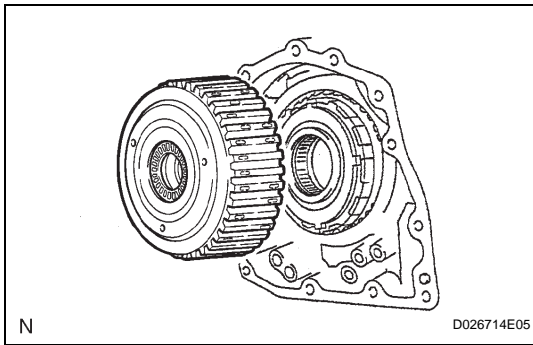
- (a) Coat the planetary carrier thrust washer with yellow petrolatum, and install the washer onto the rear planetary sun gear.



- (b) Coat the bearing with yellow petrolatum, and install the bearing onto the rear planetary sun gear.

**Standard bearing diameter**

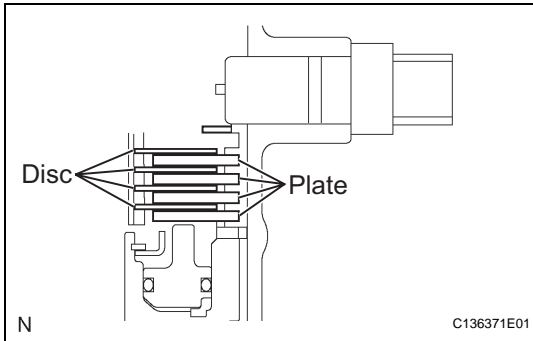
Item	Inside	Outside
Race	33.0 mm (1.299 in.)	45.4 mm (1.787 in.)
Bearing	31.85 mm (1.254 in.)	45.2 mm (1.78 in.)



- (c) Install the rear planetary sun gear to the rear planetary gear.

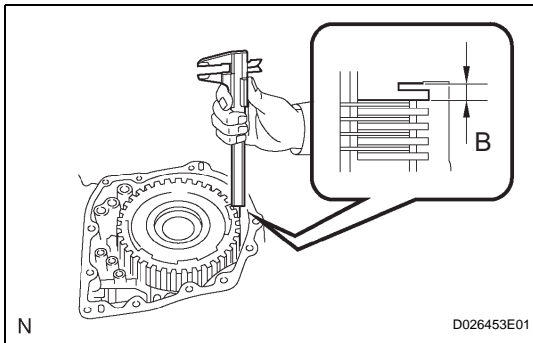
**NOTICE:**

**After installing the rear planetary sun gear, make sure that the B1 discs are engaged.**



**26. INSTALL 2ND BRAKE CLUTCH DISC**

- (a) Coat the 4 discs with ATF.  
 (b) Install the 4 plates, 4 discs and flange to the transaxle case.  
 (c) Temporarily install the snap ring.



**27. INSPECT PACK CLEARANCE OF 2ND BRAKE**

- (a) Using a vernier caliper, measure the distance between the disc surface and snap ring surface (Dimension B).  
 (b) Select an appropriate flange so that the pack clearance will meet the specified value.

**Standard clearance:**

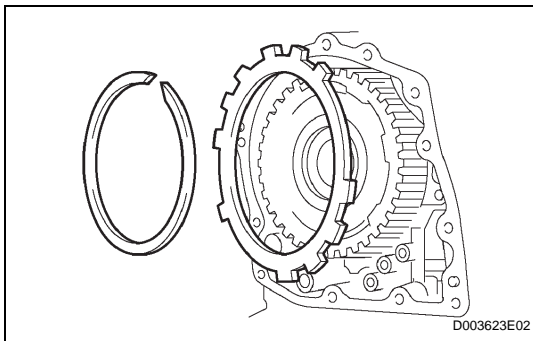
**0.62 to 0.91 mm (0.0244 to 0.0358 in.)**

**HINT:**

Piston stroke = Dimension B - Flange thickness - Snap ring thickness 1.6 mm (0.063 in.)

**Standard flange thickness**

Mark	Thickness	Mark	Thickness
1	3.0 mm (0.118 in.)	5	3.4 mm (0.134 in.)
2	3.1 mm (0.122 in.)	6	3.5 mm (0.138 in.)
3	3.2 mm (0.126 in.)	7	3.6 mm (0.142 in.)
4	3.3 mm (0.130 in.)	8	-

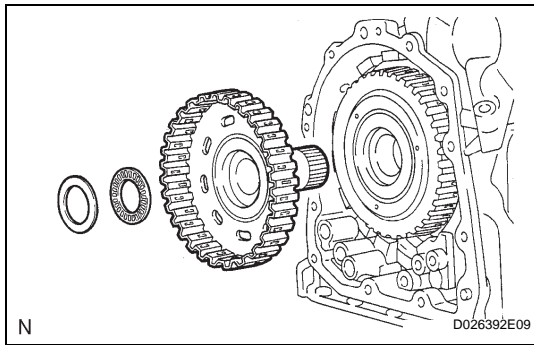


- (c) Temporarily remove the snap ring, attach the selected flange and reinstall the snap ring.

**NOTICE:**

**Secure the snap ring so that the ends are visible through the groove of the transaxle case.**

AX



## 28. INSTALL OVERDRIVE DIRECT CLUTCH HUB SUB-ASSEMBLY

- (a) Install the direct clutch hub to the planetary gear.

### NOTICE:

**Be careful not to damage the bushing inside the overdrive clutch hub during installation.**

- (b) Coat the thrust bearing with ATF.

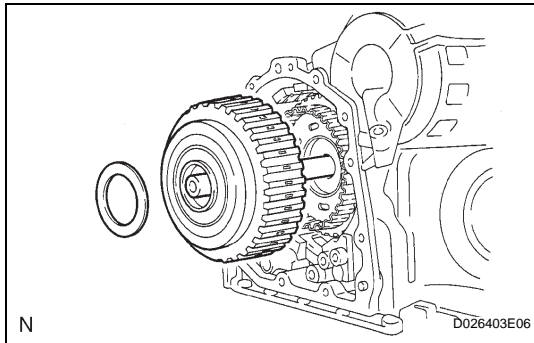
- (c) Install the bearing race and the thrust bearing to the direct clutch hub.

### NOTICE:

**Be careful not to drop the bearing when it is installed.**

**Standard bearing and race diameter**

Item	Inside	Outside
Bearing	24.7 mm (0.972 in.)	39.5 mm (1.555 in.)
Race	23.6 mm (0.929 in.)	38.0 mm (1.496 in.)



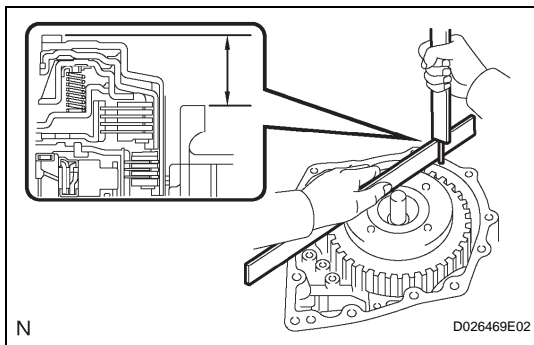
## 29. INSTALL DIRECT CLUTCH ASSEMBLY

- (a) Coat the thrust bearing with ATF.

- (b) Install the direct clutch and thrust bearing to the rear planetary sun gear.

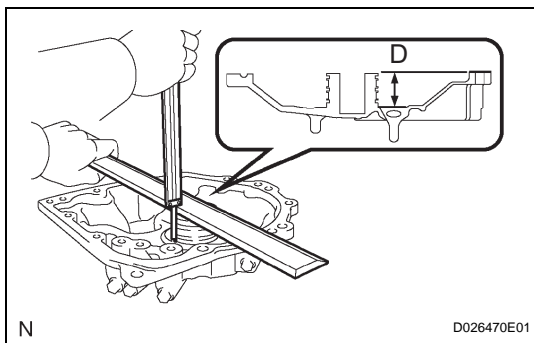
### NOTICE:

**The disc in the direct clutch should completely match with the hub attached outside the rear planetary sun gear. Otherwise, the rear cover cannot be installed.**



- (c) Clean the connecting part of the transaxle case and the rear cover.

- (d) As shown in the illustration, place a straightedge on the direct clutch drum and measure the distance between the transaxle case and the straightedge using a vernier caliper (Dimension D).



- (e) Using a vernier caliper and straightedge, measure the dimension shown in the illustration.

- (f) Calculate the end play value using the following formula. Select a thrust bearing which satisfies the end play value and install the selected bearing.

### Standard end play:

**0.244 to 0.901 mm (0.0096 to 0.0355 in.)**

### NOTICE:

**Make sure that the non-collared race side is facing the direct clutch.**

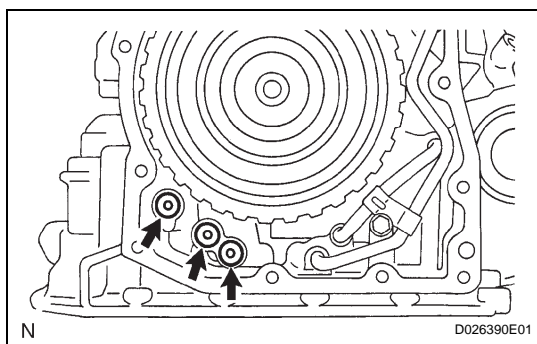
### HINT:

End play = Dimension D - Dimension C

**Standard bearing thickness and diameter**

Thickness	Inside	Outside
3.6 mm (0.1417 in.)	56.3 mm (2.217 in.)	75.7 mm (2.980 in.)

Thickness	Inside	Outside
3.8 mm (0.1496 in.)	56.3 mm (2.217 in.)	75.7 mm (2.980 in.)



### 30. INSTALL NO. 1 GOVERNOR APPLY GASKET

- (a) Install 3 new governor apply gaskets to the transaxle case.

### 31. INSTALL BRAKE APPLY TUBE

- (a) Install the clamp to the brake apply tube.

#### NOTICE:

**Make sure to install the clamp to the apply tube before installing the apply tube to the transaxle case. This prevents the apply tube from being deformed or damaged.**

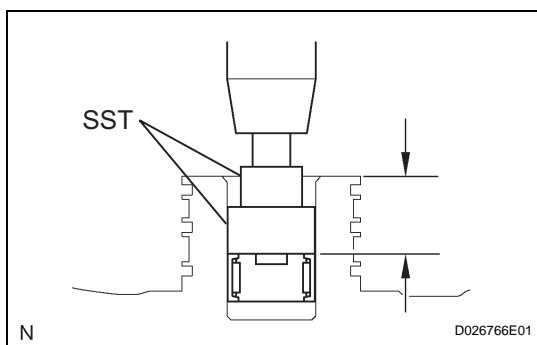
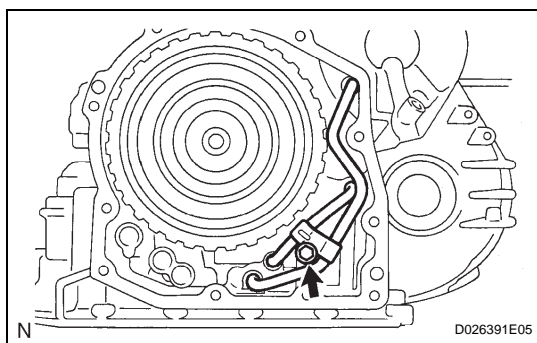
- (b) Install the clutch apply tube.

- (c) Install the brake apply tube to the transaxle case with a bolt.

**Torque: 5.4 N\*m (55 kgf\*cm, 48 in.\*lbf)**

#### NOTICE:

**The tube should be securely inserted until it reaches the stopper.**



### 32. INSTALL NEEDLE ROLLER BEARING

- (a) Using SST and a press, press the needle roller bearing into the transaxle rear cover.

**SST 09950-60010 (09951-00230, 09952-06010)**

**Standard depth:**

**20.55 to 21.25 mm (0.8091 to 0.8366 in.)**

#### NOTICE:

- The engraved mark side of the bearing should face upward.
- Continue pressing until the specified value is obtained.

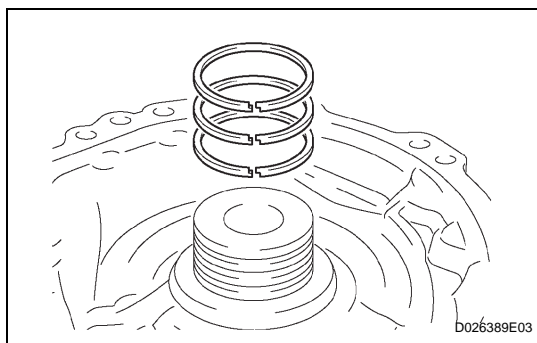
- (b) Coat a needle roller bearing with ATF.

### 33. INSTALL REAR CLUTCH OIL SEAL RING OUTER

- (a) Coat 3 new rear clutch oil seal rings with ATF, and install them to the transaxle rear cover.

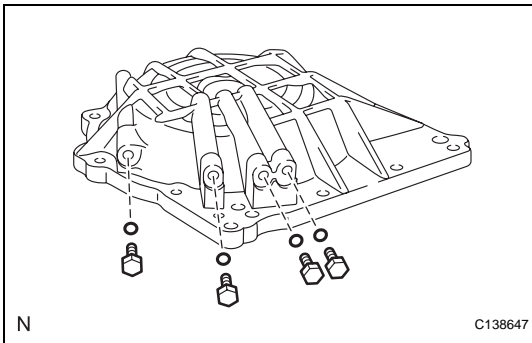
#### NOTICE:

**The snap ring should be fully engaged in the groove of the drum.**



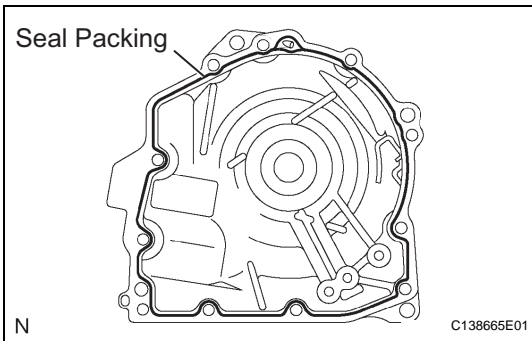


AX

**34. INSTALL NO. 1 TRANSAXLE CASE PLUG**

- (a) Coat 4 new O-rings with ATF.
- (b) Install the 4 O-rings to the 4 plugs.
- (c) Install the 4 plugs to the transaxle rear cover.

**Torque: 7.4 N\*m (75 kgf\*cm, 65 in.\*lbf)**

**35. INSTALL TRANSAXLE REAR COVER SUB-ASSEMBLY**

- (a) Remove any packing material and be careful not to spill oil on the contact surfaces of the transaxle rear cover or the transaxle case.
- (b) Apply seal packing to the cover.

**Seal packing:**

**Toyota Genuine Seal Packing 1281,  
Three Bond 1281 or Equivalent**

**NOTICE:**

**Make sure that the seal packing is applied in a bead (section diameter:  $\phi 1.2$  mm (0.047 in.)) so that the entire sealing surface will be evenly sealed. The seal packing should also protrude slightly from the flange after the installation of the cover has been completed.**

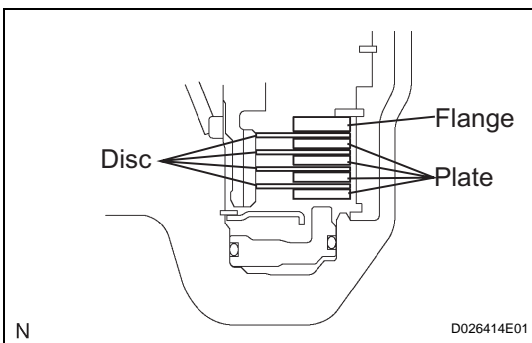
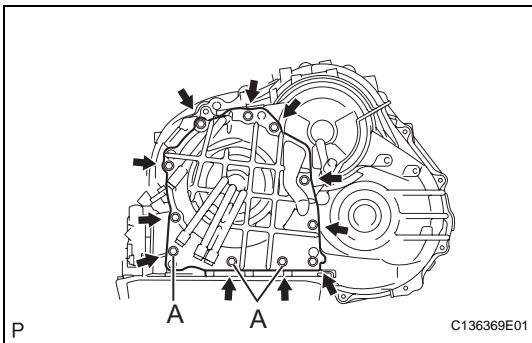
- (c) Apply adhesive to the bolt threads of bolt A.

**Adhesive:**

**Toyota Genuine Adhesive 1344,  
Three Bond 1344 or Equivalent**

- (d) Install the 11 bolts.

**Torque: 19 N\*m (190 kgf\*cm, 14 ft.\*lbf) for bolt A  
25 N\*m (250 kgf\*cm, 18 ft.\*lbf) for other bolts**

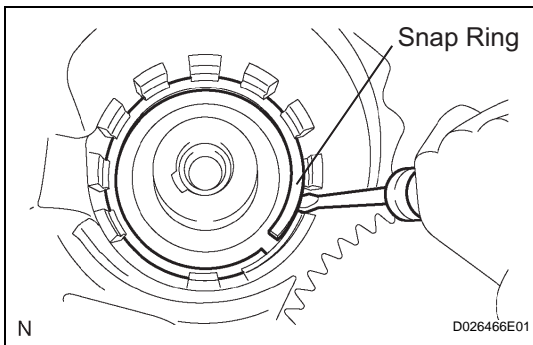
**36. INSTALL NO. 2 UNDERDRIVE CLUTCH DISC**

- (a) Coat the 4 discs with ATF.
- (b) Install the 4 discs, 4 plates and flange to the transaxle case.

**NOTICE:**

**Be careful of the order of the discs, plate and flange.**

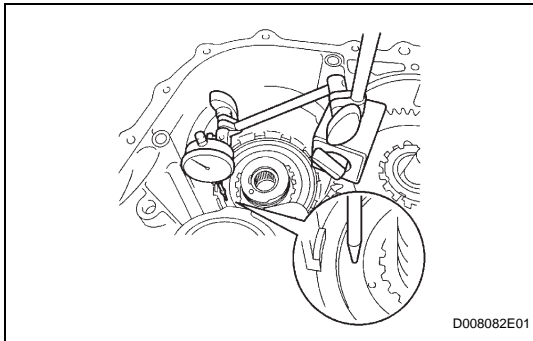




- (c) Using a screwdriver, install the snap ring.

**NOTICE:**

The snap ring should be fully engaged in the groove of the drum.



### 37. INSPECT PACK CLEARANCE OF UNDERDRIVE BRAKE

- (a) Using a dial indicator, measure the underdrive brake pack clearance while applying and releasing compressed air (392 kPa, 4.0 kgf/cm<sup>2</sup>, 57 psi).

**Standard pack clearance:**

1.81 to 2.20 mm (0.0713 to 0.0866 in.)

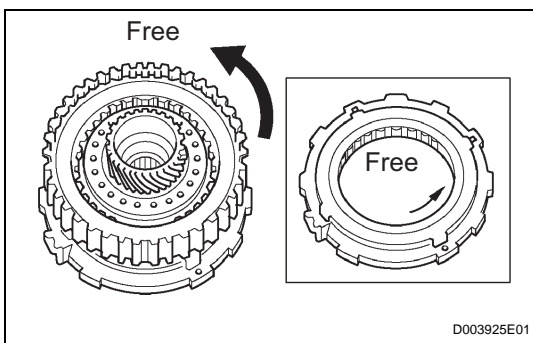
**HINT:**

Select an appropriate flange from the table below so that it will meet the specified value.

**Standard flange thickness**

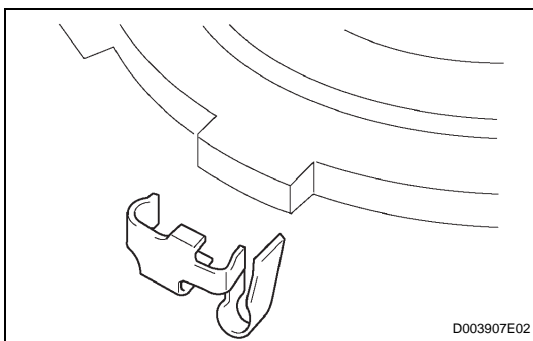
Mark	Thickness	Mark	Thickness
1	3.0 mm (0.118 in.)	4	3.1 mm (0.122 in.)
2	3.2 mm (0.126 in.)	5	3.3 mm (0.130 in.)
3	3.4 mm (0.134 in.)	-	-

- (b) Temporarily remove the snap ring, attach the selected flange and reinstall the snap ring.  
 (c) Reinstall the snap ring.



### 38. INSPECT UNDERDRIVE 1-WAY CLUTCH ASSEMBLY

- (a) Install the underdrive clutch to the 1-way clutch.  
 (b) Check that the underdrive 1-way clutch locks when turned clockwise and rotates freely when turned counterclockwise as shown in the illustration. If the result is not as specified, replace the underdrive 1-way clutch.

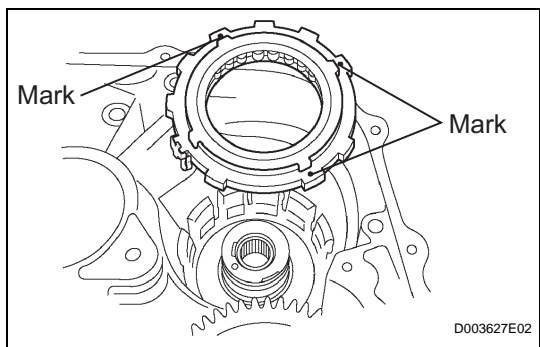


### 39. INSTALL UNDERDRIVE 1-WAY CLUTCH ASSEMBLY

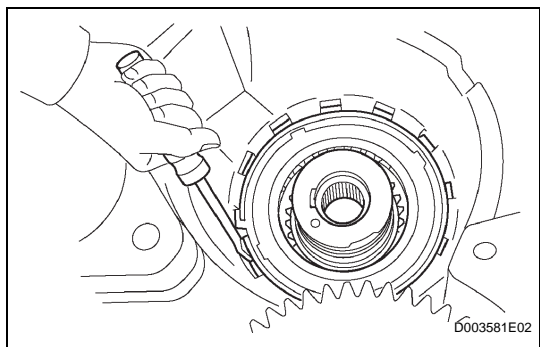
- (a) Install the outer race retainer to the 1-way clutch.

**NOTICE:**

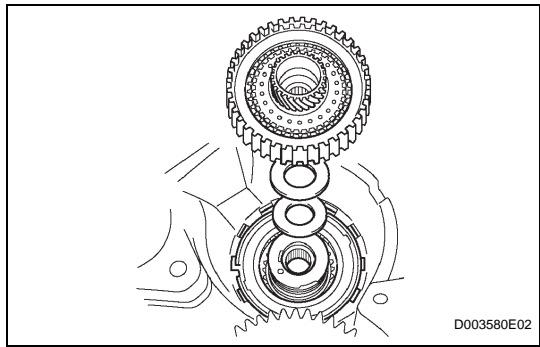
Fix the outer race retainer to the external tooth of the 1-way clutch firmly.



- (b) Install the 1-way clutch to the transaxle case.
- NOTICE:**  
Make sure that the mark on the 1-way clutch outer race is visible.



- (c) Using a screwdriver, install the snap ring to the transaxle case.
- NOTICE:**  
The snap ring should be fully engaged in the groove of the transaxle case.

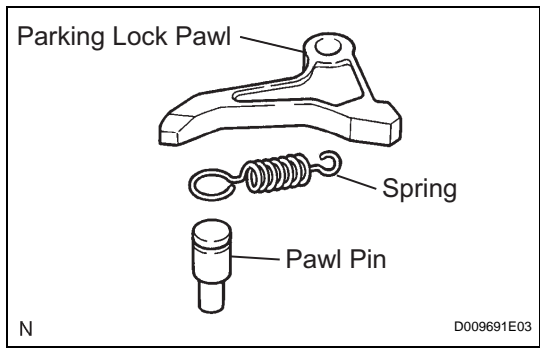


**40. INSTALL UNDERDRIVE CLUTCH ASSEMBLY**

- (a) Coat the bearing and bearing race with petrolatum, and install them onto the underdrive clutch.
- Standard bearing and bearing race diameter**

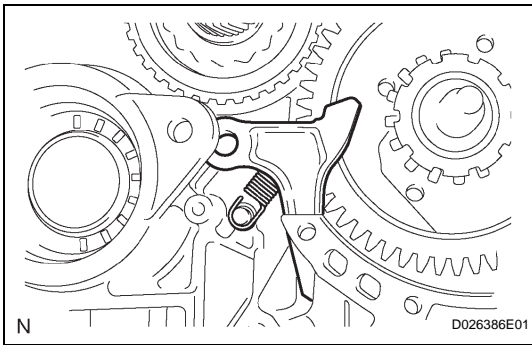
Item	Inside	Outside
Bearing	37.73 mm (1.4854 in.)	58.0 mm (2.2835 in.)
Race	29.9 mm (1.1772 in.)	55.5 mm (2.185 in.)

- (b) Install the underdrive clutch to the transaxle case.
- NOTICE:**  
Do not damage the oil seal when installing the underdrive clutch drum.

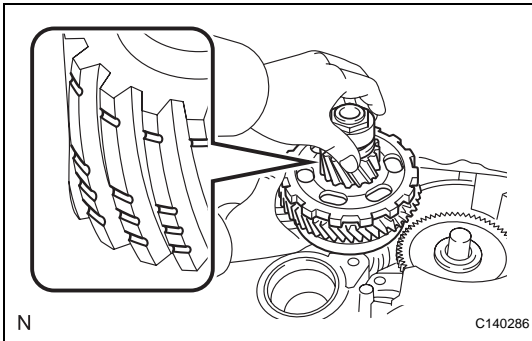


**41. INSTALL PARKING LOCK PAWL**

- (a) Install the pawl pin and spring to the parking lock pawl.



- (b) Temporarily install the parking lock pawl, shaft and spring to the transaxle case, as shown in the illustration.



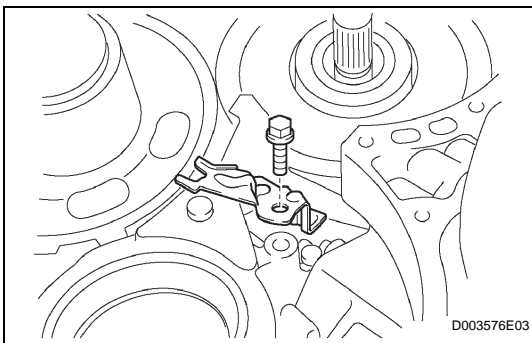
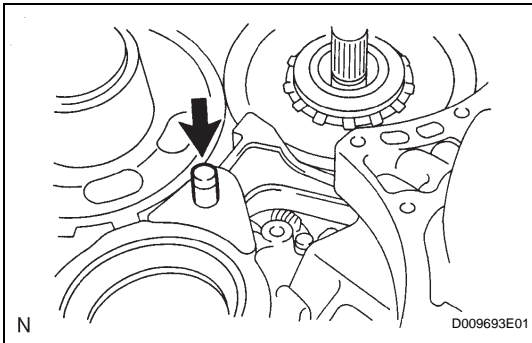
#### 42. INSTALL UNDERDRIVE PLANETARY GEAR ASSEMBLY

- (a) Install the underdrive planetary gear to the transaxle case.

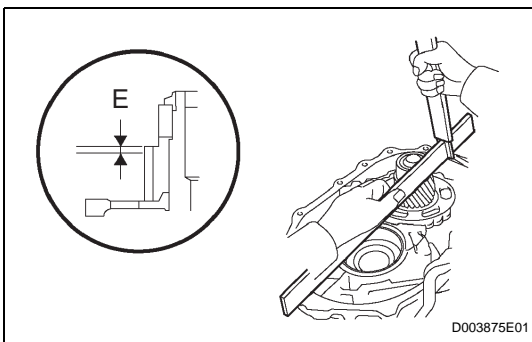
##### NOTICE:

- Check the position and number of the grooves on each end face of the differential drive pinion gear.
- Fully engage all the discs of underdrive clutch and hub splines of the underdrive planetary gear and install them securely.

- (b) Install the parking lock pawl shaft.



- (c) Install the pawl shaft clamp with the bolt.  
**Torque: 9.8 N\*m (100 kgf\*cm, 87 in.\*lbf)**

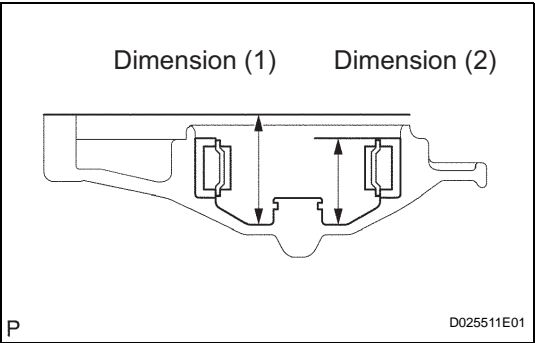


- (d) Using a straightedge and vernier caliper as shown in the illustration, measure the gap between the top of the differential drive pinion in the underdrive planetary gear and the contact surface of the transaxle case and housing (Dimension E).

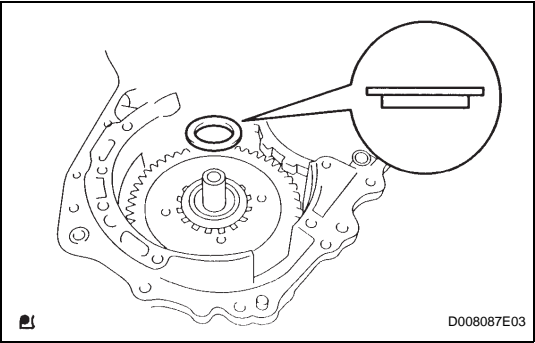
##### NOTICE:

**Record dimension E for the following process.**

AX



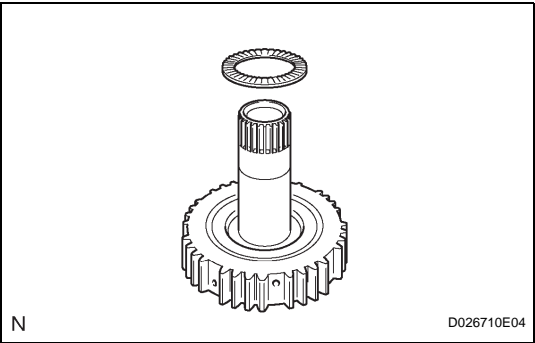
- (e) As shown in the illustration, measure the 2 places of the transaxle housing, and calculate dimension F using the formula below.
- NOTICE:**  
**Record dimension F for the following process.**
- HINT:**  
Dimension F = Dimension (1) - Dimension (2)



**43. INSTALL MULTIPLE DISC CLUTCH HUB**

- (a) Install the thrust bearing race to the transaxle case while checking its direction.
- Standard bearing race diameter**

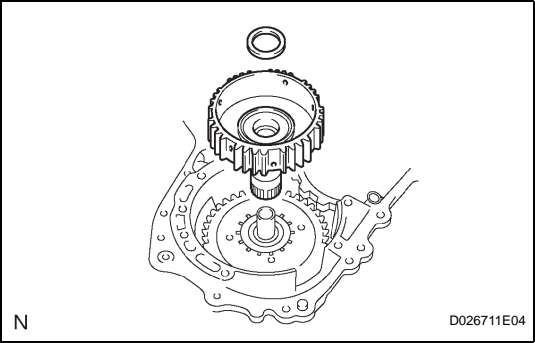
Item	Inside	Outside
Bearing race	39.5 mm (1.555 in.)	45.8 mm (1.803 in.)



- (b) Coat the thrust needle roller bearing and race with yellow petrolatum, and install them onto the multiple disc clutch hub.
- Standard thrust bearing and race diameter**

Item	Inside	Outside
Thrust Bearing	36.4 mm (1.433 in.)	52.2 mm (2.055 in.)

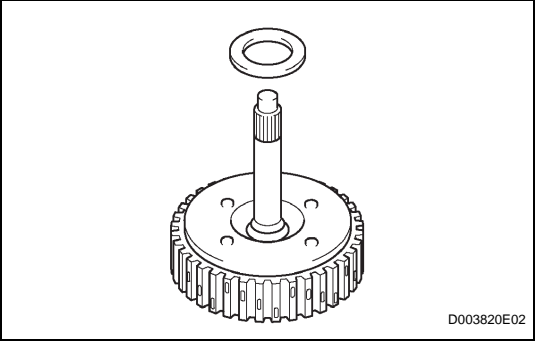
- (c) Coat the needle roller bearing with ATF.



- (d) Install the needle roller bearing to the multiple clutch hub.
- Standard bearing diameter**

Item	Inside	Outside
Bearing	23.6 mm (0.929 in.)	44 mm (1.732 in.)

- (e) Install the multiple clutch hub to the transaxle case.



**44. INSTALL FORWARD CLUTCH ASSEMBLY**

- (a) Coat the thrust needle roller bearing with ATF.
- (b) Install the thrust needle roller bearing to the forward clutch.
- Standard thrust bearing diameter**

Item	Inside	Outside
Thrust Bearing	33.58 mm (1.3220 in.)	51.9 mm (2.043 in.)

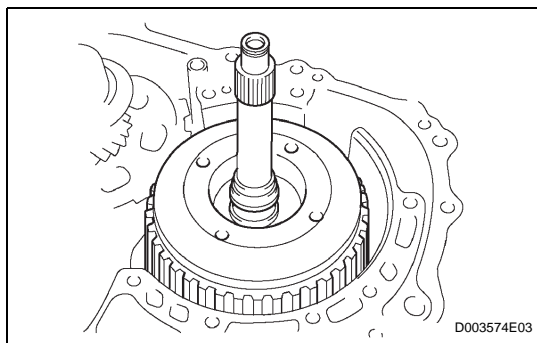
**NOTICE:**

Install the thrust bearing properly so that the non-collared race or blue ink jet race will be visible.

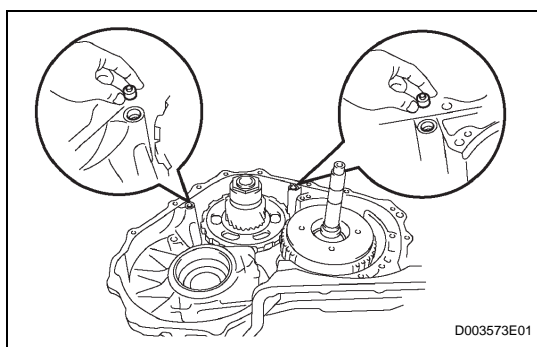
- (c) Install the forward clutch to the transaxle case.

**NOTICE:**

- Align the splines of all discs in the forward clutch with those of multiple clutch hub to install them securely.
- Be careful not to damage the bushing inside of the forward clutch hub during installation.

**AX****45. INSTALL OVERDRIVE BRAKE GASKET**

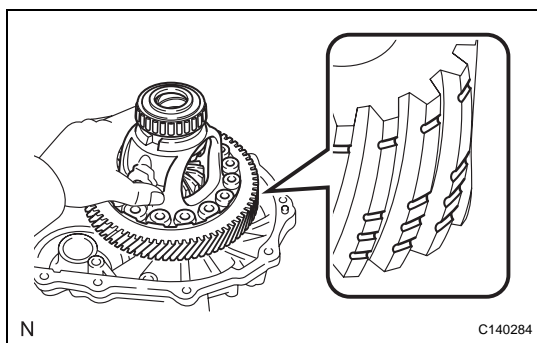
- (a) Install 2 new overdrive brake gaskets.

**46. INSTALL DIFFERENTIAL GEAR ASSEMBLY**

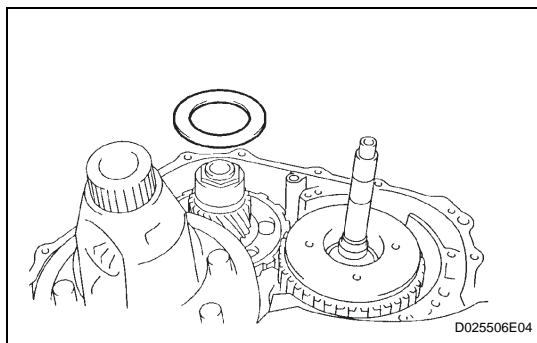
- (a) Install the differential gear to the transaxle case.

**NOTICE:**

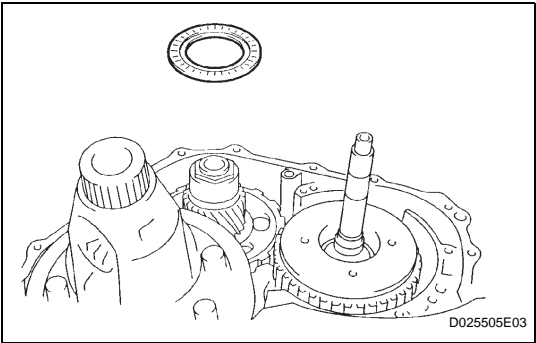
Check the position and number of the grooves on each end face of the differential ring gear.

**47. INSTALL NO. 2 THRUST BEARING UNDERDRIVE RACE**

- (a) Install the thrust bearing underdrive race to the underdrive planetary gear.



AX



48. INSTALL THRUST NEEDLE ROLLER BEARING

- (a) Coat the thrust needle roller bearing with ATF.
- (b) Calculate the end play value using the following formula and values of Dimension E and F that were measured when installing the cylindrical roller bearing and underdrive planetary gear. Select an appropriate underdrive planetary gear thrust bearing race which satisfies the specified end play value, and install the selected bearing race.

**Standard end play:**

**0.498 to 0.993 mm (0.01961 to 0.03909 in.)**

**HINT:**

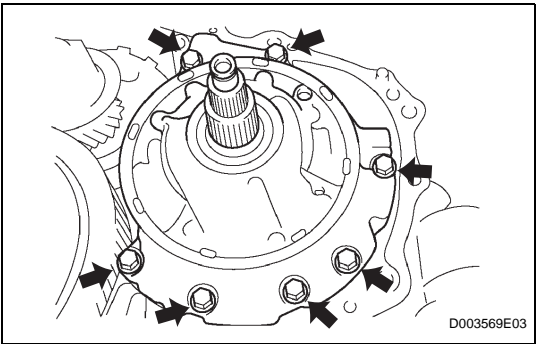
End play = Dimension F - Dimension E - thrust bearing thickness 2.5 mm (0.0984 in.) - underdrive thrust bearing race thickness.

**Standard race thickness**

F - E	Thickness
Less than 7.72 mm (0.3039 in.)	3.5 mm (0.138 in.)
7.72 mm (0.3039 in.)	3.8 mm (0.150 in.)

**Standard bearing and bearing race diameter**

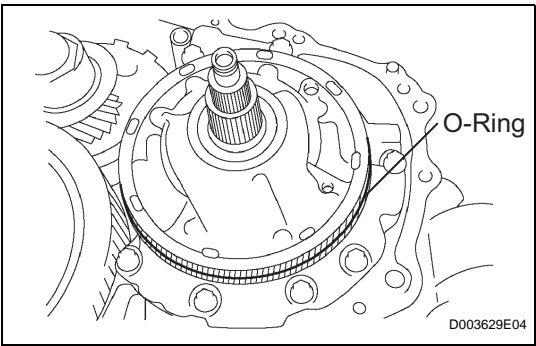
Item	Inside	Outside
Bearing	57.2 mm (2.252 in.)	84.96 mm (3.345 in.)
Bearing race	56.4 mm (2.22 in.)	83 mm (3.268 in.)



49. INSTALL OIL PUMP ASSEMBLY

- (a) Install the oil pump to the transaxle case with the 7 bolts.

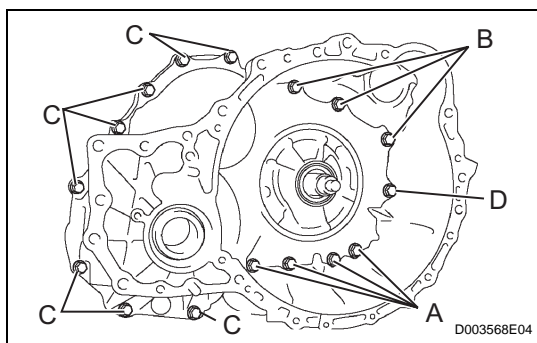
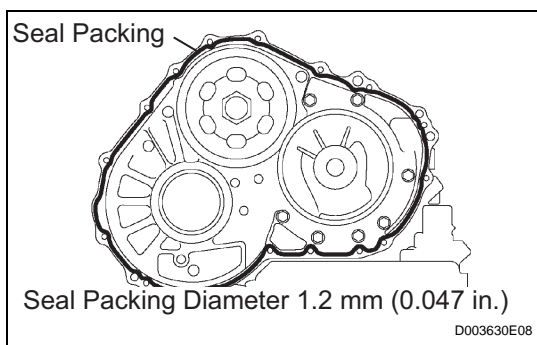
**Torque: 22 N\*m (226 kgf\*cm, 16 ft.\*lbf)**



- (b) Coat the O-ring of oil pump with ATF.

**NOTICE:**

**Confirm that the input shaft rotates smoothly by manual operation after installing the oil pump.**



## 50. INSTALL TRANSAXLE HOUSING

- Remove any packing material and be careful not to spill oil on the contact surface of the transaxle case or transaxle housing.
- Apply seal packing to the transaxle case.

### Seal packing:

**Toyota Genuine Seal Packing 1281,  
Three Bond 1281 or Equivalent**

- Apply adhesive or equivalent to bolts A and D.

- Install the transaxle housing and 16 bolts to the transaxle case.

**Torque:** 22 N\*m (224 kgf\*cm, 16 ft.\*lbf) for bolt A  
 29 N\*m (295 kgf\*cm, 21 ft.\*lbf) for bolt B  
 29 N\*m (295 kgf\*cm, 21 ft.\*lbf) for bolt C  
 22 N\*m (226 kgf\*cm, 16 ft.\*lbf) for bolt D

### Adhesive:

**Toyota Genuine Adhesive 1344,  
Three Bond 1344 or Equivalent**

### HINT:

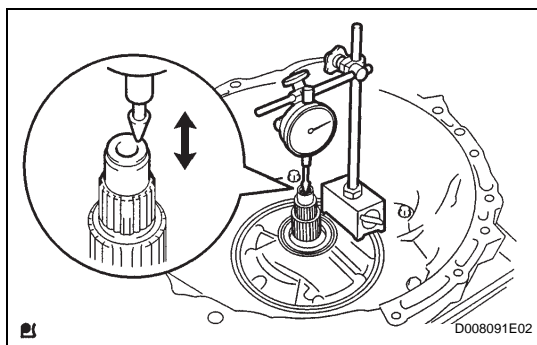
Each bolt length is indicated below.

### Bolt length:

50 mm (1.97 in.) for bolt A  
 50 mm (1.97 in.) for bolt B  
 42 mm (1.65 in.) for bolt C  
 72 mm (2.84 in.) for bolt D

### NOTICE:

Tighten the bolts within 10 minutes of adhesive application.

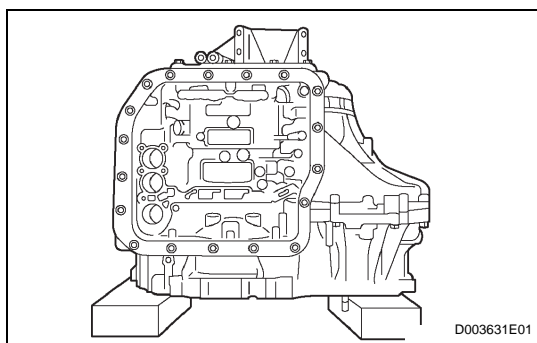


## 51. INSPECT INPUT SHAFT END PLAY

- Using a dial indicator, measure the input shaft end play.

### Standard end play:

0.262 to 1.249 mm (0.0100 to 0.0494 in.)

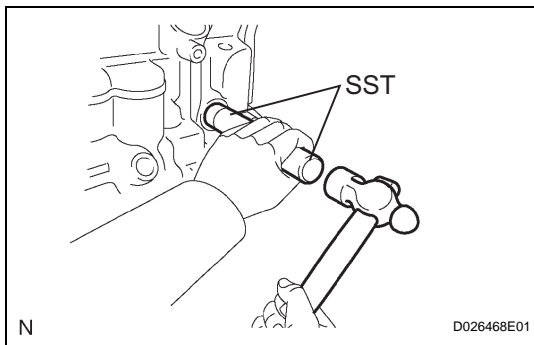


## 52. FIX AUTOMATIC TRANSAXLE ASSEMBLY

- Fix the transaxle.



AX

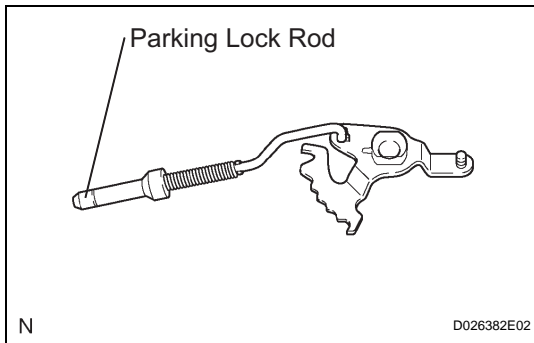
**53. INSTALL MANUAL VALVE LEVER SHAFT OIL SEAL**

- (a) Coat a new oil seal with MP grease.
- (b) Install the oil seal to the transaxle case.

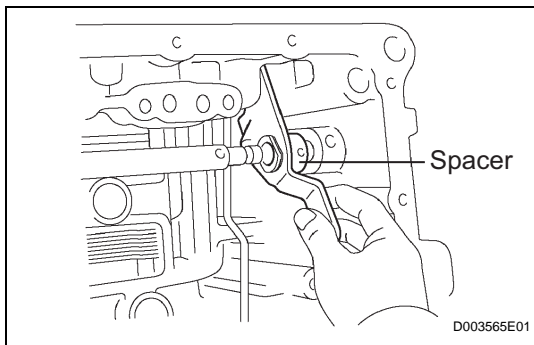
**SST 09950-60010 (09951-00230), 09950-70010 (09951-07100)**

**Standard depth:**

**0 +/- 0.5 mm (0 +/- 0.197 in. )**

**54. INSTALL PARKING LOCK ROD SUB-ASSEMBLY**

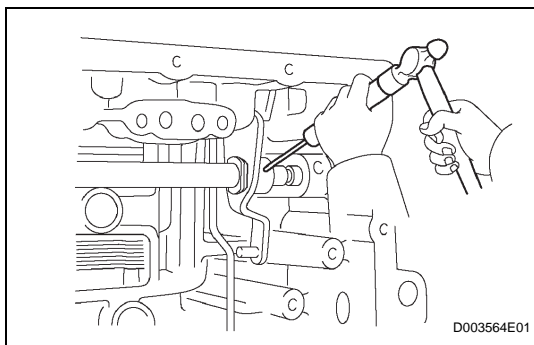
- (a) Install the parking lock rod to the manual valve lever.

**55. INSTALL MANUAL VALVE LEVER SUB-ASSEMBLY**

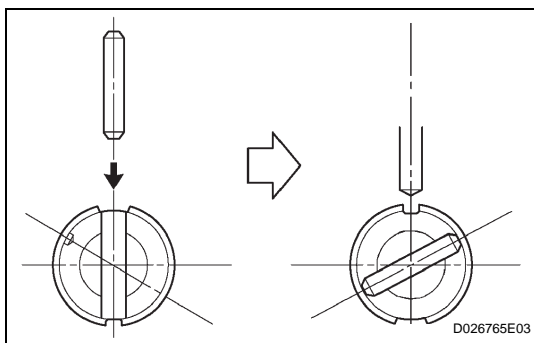
- (a) Install a new spacer and manual valve lever shaft to the transaxle case.

**NOTICE:**

**Do not damage the oil seal when installing the shaft to the transaxle case.**

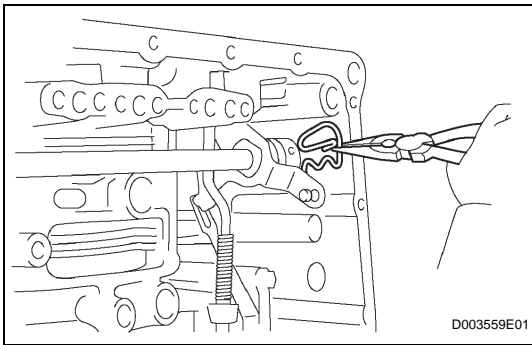


- (b) Using a pin punch and hammer, drive in a new pin.



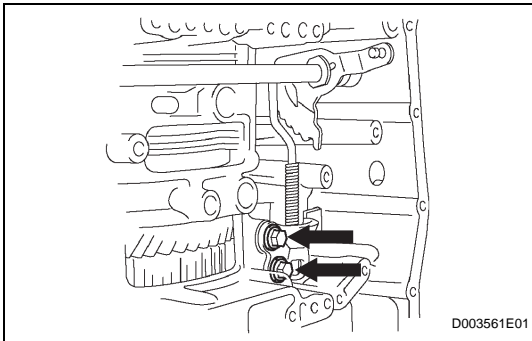
- (c) Turn the spacer and the lever shaft to align the small hole (for locating the staking position in the spacer) with the staking position mark on the lever shaft.
- (d) Using a pin punch, stake the spacer through the small hole.
- (e) Check that the spacer does not turn.





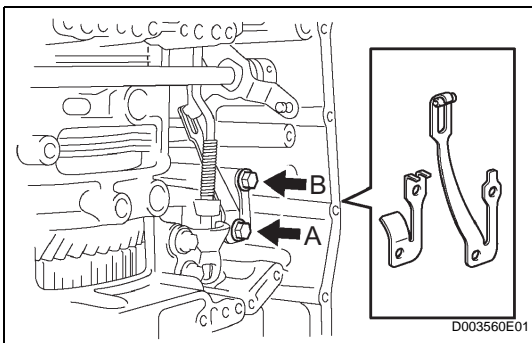
## 56. INSTALL MANUAL VALVE LEVER SHAFT RETAINER SPRING

- (a) Using needle-nose pliers, install the retainer spring.  
**NOTICE:**  
 Hang the spring on the shaft firmly.



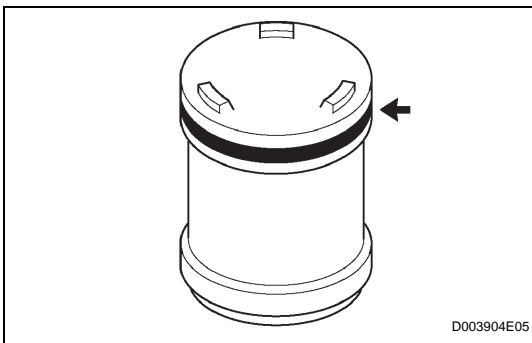
## 57. INSTALL PARKING LOCK PAWL BRACKET

- (a) Install the parking lock pawl bracket with the 2 bolts.  
**Torque:** 20 N\*m (205 kgf\*cm, 15 ft.\*lbf)  
**HINT:**  
 The bolt length is indicated below.  
**Bolt length:**  
 25 mm (0.984 in.)  
**NOTICE:**  
 Make sure that the parking rod is placed between the parking pawl and the guide of the parking bracket when the parking bracket is installed.



## 58. INSTALL MANUAL DETENT SPRING SUB-ASSEMBLY

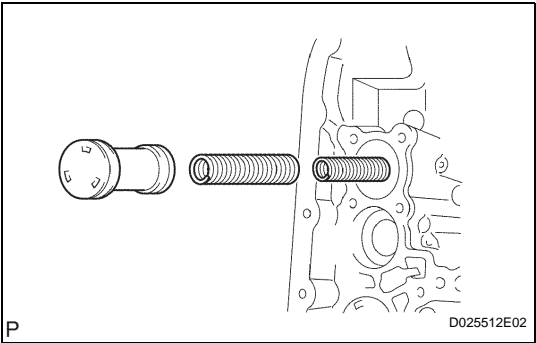
- (a) Install the manual detent spring and cover with the 2 bolts.  
**NOTICE:**  
 Make sure to install the manual detent spring and cover in this order.  
**HINT:**  
 Tighten bolt A first, and then bolt B.  
**Torque:** 20 N\*m (204 kgf\*cm, 15 ft.\*lbf) for bolt A  
 12 N\*m (122 kgf\*cm, 9 ft.\*lbf) for bolt B  
**HINT:**  
 Each bolt length is indicated below.  
**Bolt length:**  
 27 mm (1.06 in.) for bolt A  
 16 mm (0.63 in.) for bolt B



## 59. INSTALL B-3 ACCUMULATOR PISTON

- (a) Coat a new O-ring with ATF, and install it to the B-3 accumulator piston.  
**NOTICE:**  
 Make sure that the O-ring is not twisted and that it does not protrude abnormally from the accumulator piston. Apply sufficient ATF before installing the O-ring. The O-ring must be installed in the correct position.

AX



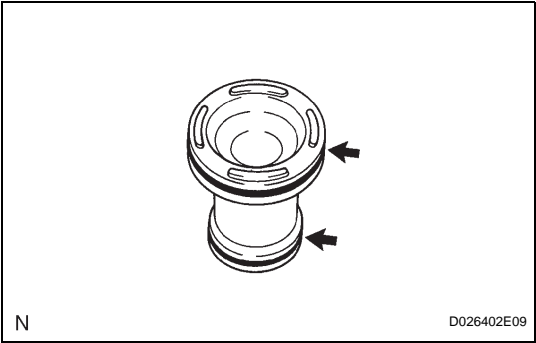
- (b) Install the accumulator piston to the transaxle case.
- (1) Coat the piston with ATF.
  - (2) Install the 2 springs to the piston, and install the piston (with springs) to the transaxle case.

**NOTICE:**

**Before installing the springs, check the identification color of each spring.**

**Standard accumulator spring**

Spring	Free length / Outer diameter	Identification Color
Inner	62.00 mm (2.4409 in.) / 15.50 mm (0.610 in.)	Purple
Outer	74.23 mm (2.9224 in.) / 21.70 mm (0.854 in.)	

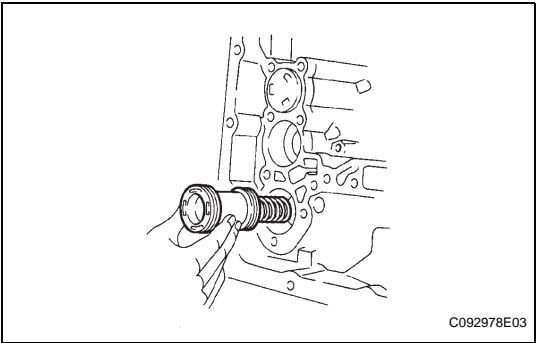


**60. INSTALL REVERSE CLUTCH ACCUMULATOR PISTON**

- (a) Coat 2 new O-rings with ATF, and install them to the reverse accumulator piston.

**NOTICE:**

**Make sure that the O-ring is not twisted and that it does not protrude abnormally from the accumulator piston. Apply sufficient ATF before installing the O-ring. The O-ring must be installed in the correct position.**



- (b) Install the piston to the transaxle case.
- (1) Coat the accumulator piston with ATF.
  - (2) Install the spring to the piston, and install the piston (with spring) to the transaxle case.

**NOTICE:**

**Before installing the spring, check the identification color of the spring.**

**Standard accumulator spring**

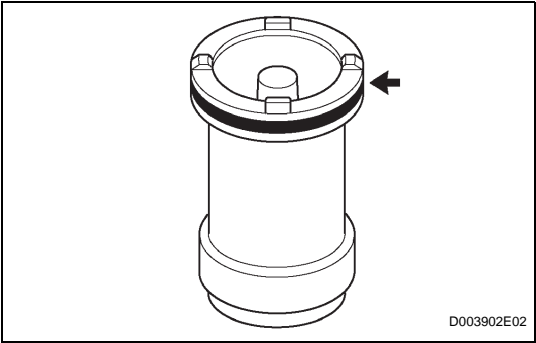
Free length Outer diameter	Identification Color
60.96 mm (2.3999 in.) / 14.10 mm (0.555 in.)	Yellow

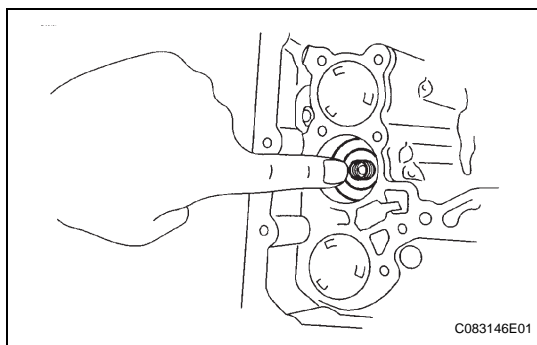
**61. INSTALL C-3 ACCUMULATOR PISTON**

- (a) Coat a new O-ring with ATF, and install it to the C-3 accumulator piston.

**NOTICE:**

**Make sure that the O-ring is not twisted and that it does not protrude abnormally from the accumulator piston. Apply sufficient ATF before installing the O-ring. The O-ring must be installed in the correct position.**



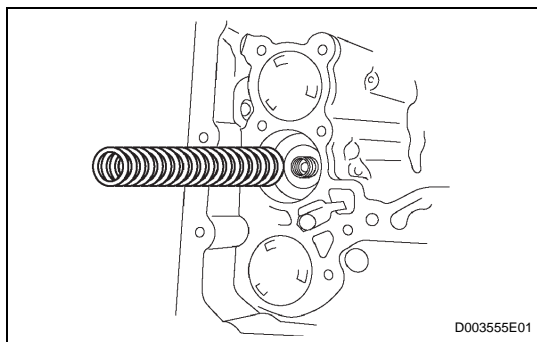


- (b) Coat the piston with ATF, install it to the transaxle case.

**NOTICE:**

Install the springs to each accumulator piston, checking the identification color of each spring.  
Standard accumulator spring  
Standard accumulator spring

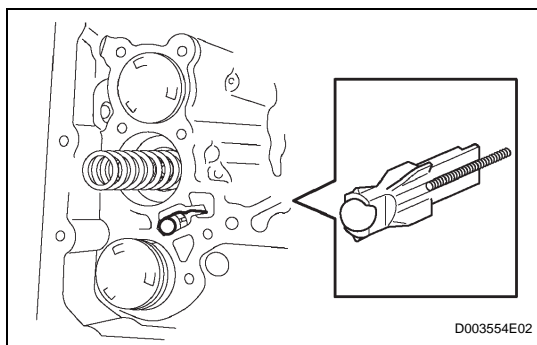
Free length Outer diameter	Color
72.20 mm (2.8425 in.) / 19.0 mm (0.748 in.)	Colorless



- (c) Install the spring to the C-3 accumulator piston.

**NOTICE:**

Install the springs to each accumulator piston, checking the identification color of each spring.

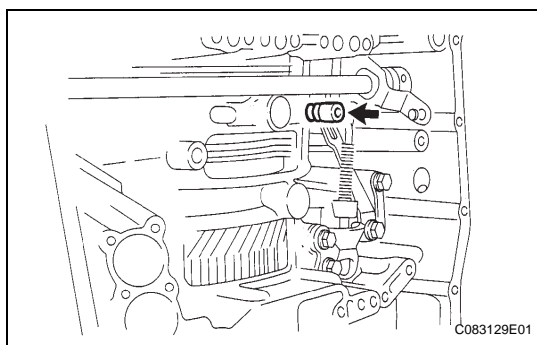


## 62. INSTALL CHECK BALL BODY

- (a) Coat the check ball body with ATF.  
(b) Install the check ball body and spring.

**NOTICE:**

Be sure to place the spring in the hole in the check ball body. Be careful of the direction of the parts.

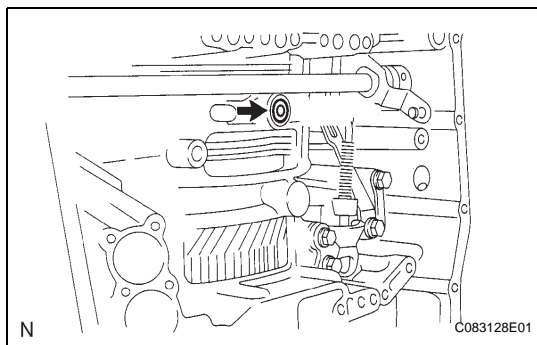


## 63. INSTALL BRAKE DRUM GASKET

- (a) Coat a new brake drum gasket with ATF, and install it to the transaxle case.

**NOTICE:**

Be sure not to damage the lip of the transaxle case brake gasket when inserting the gasket to the case. Apply sufficient ATF to the gasket before installation. Be careful of the direction of parts.



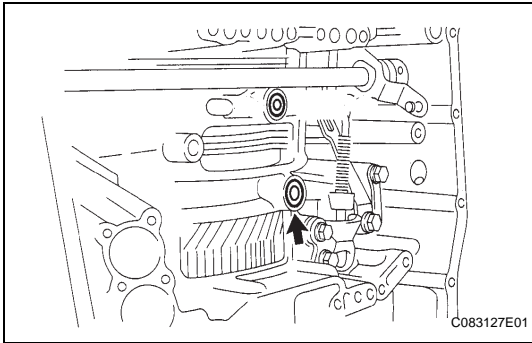
## 64. INSTALL TRANSAXLE CASE 2ND BRAKE GASKET

- (a) Coat a new transaxle case 2nd brake gasket with ATF, and install it to the transaxle case.

**NOTICE:**

Be sure not to damage the lip of the transaxle case brake gasket when inserting the gasket to the case. Apply sufficient ATF to the gasket before installation. Be careful of the direction of parts.

AX

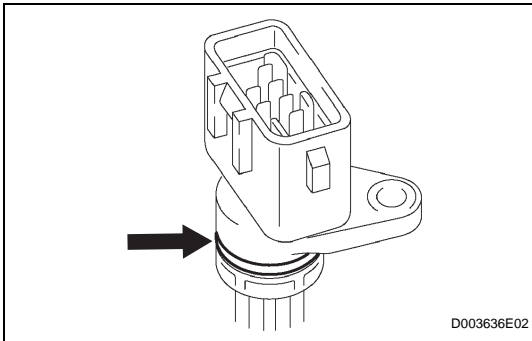


## 65. INSTALL NO. 1 GOVERNOR APPLY GASKET

- (a) Coat a new governor apply gasket with ATF, and install it to the transaxle case.

### NOTICE:

Be sure not to damage the lip of the transaxle case brake gasket when inserting the gasket to the case. Apply sufficient ATF to the gasket before installation. Be careful of the direction of parts.

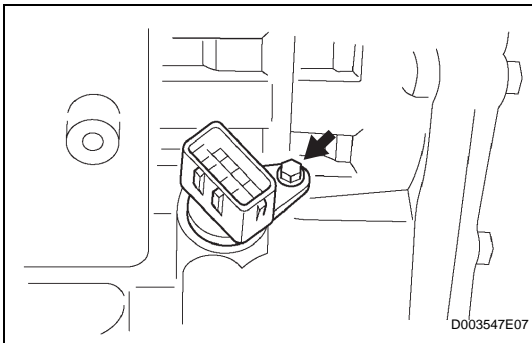


## 66. INSTALL TRANSMISSION WIRE

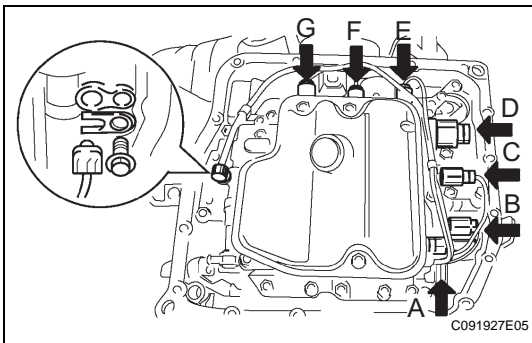
- (a) Coat a new O-ring with ATF, and install it to the transmission wire.

### NOTICE:

Make sure that the O-ring is not twisted, protruded, or pinched when installing the wire transmission to the transaxle case. Apply sufficient ATF to the O-ring before installation.



- (b) Install the transmission wire retaining bolt.  
**Torque: 5.4 N\*m (55 kgf\*cm, 48 in.\*lbf)**



## 67. CONNECT TRANSMISSION WIRE

- (a) Coat the O-ring of the ATF temperature sensor with ATF.
- (b) Apply ATF to the bolt.
- (c) Install the ATF temperature sensor with the lock plate and bolt.  
**Torque: 6.6 N\*m (67 kgf\*cm, 58 in.\*lbf)**
- (d) Connect the 7 solenoid valve connectors.

## 68. INSTALL TRANSMISSION VALVE BODY ASSEMBLY

- (a) Apply ATF to the 17 bolts.
- (b) While positioning the manual valve lever position, install the valve body to the transaxle case with the 17 bolts.

**Torque: 11 N\*m (112 kgf\*cm, 8 ft.\*lbf)**

### HINT:

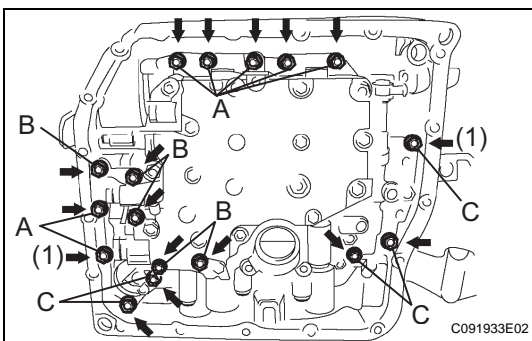
Each bolt length is indicated below.

### Bolt length:

**25 mm (0.984 in.) for bolt A**

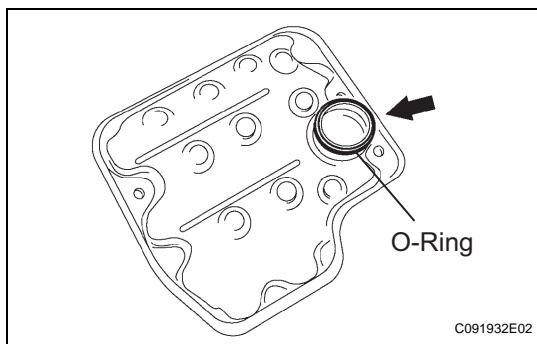
**57 mm (2.244 in.) for bolt B**

**41 mm (1.614 in.) for bolt C**



**NOTICE:**

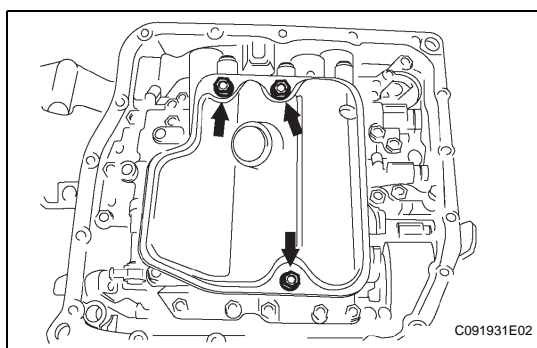
- Push the valve body against the accumulator piston spring and the check ball body to install the valve body.
- When installing the valve body to the transaxle case, do not hold the solenoids.
- Temporarily tighten the bolts marked with (1) in the illustration first because they are positioning bolts.

**AX****69. INSTALL VALVE BODY OIL STRAINER ASSEMBLY**

- (a) Coat a new O-ring with ATF and install it to the oil strainer.

**NOTICE:**

**Make sure that the O-ring is not twisted or pinched. Apply sufficient ATF to the O-ring before installation.**

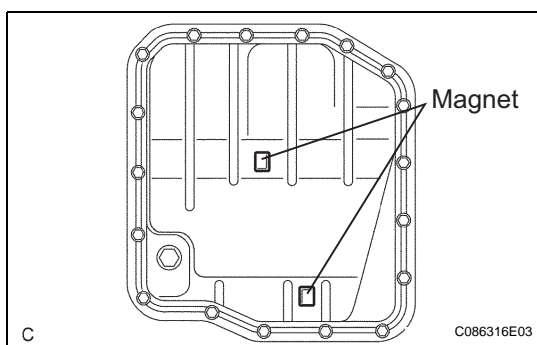


- (b) Install the oil strainer to the valve body with the 3 bolts.

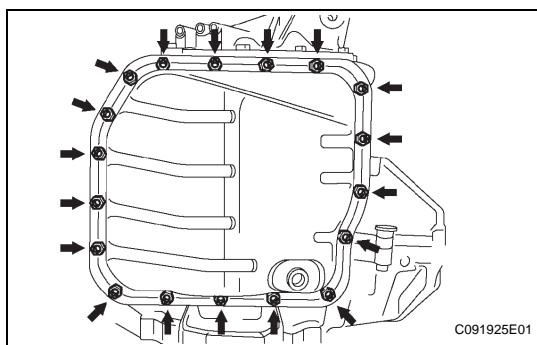
**Torque: 11 N\*m (112 kgf\*cm, 8 ft.\*lbf)**

**NOTICE:**

**Apply ATF to the bolts.**

**70. INSTALL AUTOMATIC TRANSAXLE OIL PAN SUB-ASSEMBLY**

- (a) Install the 2 magnets to the oil pan.



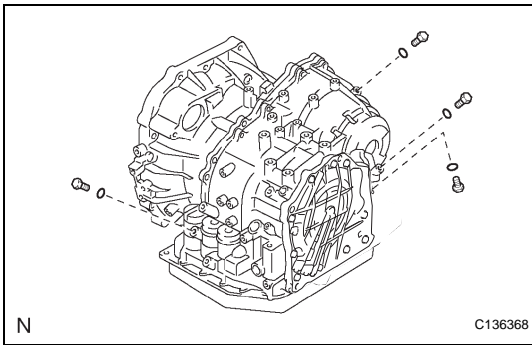
- (b) Install the oil pan and new oil pan gasket to the transaxle case with the 18 bolts.

**Torque: 7.8 N\*m (80 kgf\*cm, 69 in.\*lbf)**

**NOTICE:**

**Completely remove any oil or grease from the contact surface of the transaxle case and the oil pan with the gasket before installing the oil pan to the case.**

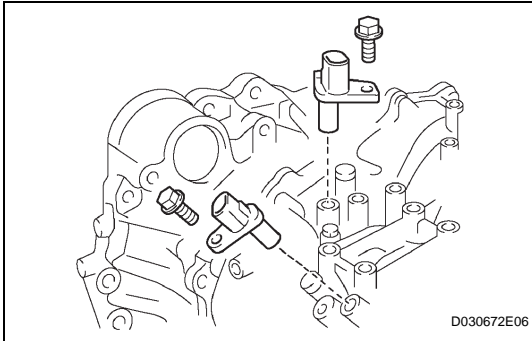
AX

**71. INSTALL NO. 1 TRANSAXLE CASE PLUG**

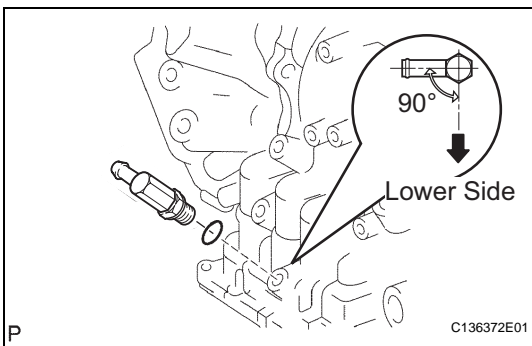
- (a) Coat 4 new O-rings with ATF, and install them to the 4 plugs.
- (b) Install the 4 plugs to the transaxle case.  
**Torque: 7.4 N\*m (75 kgf\*cm, 65 in.\*lbf)**

**72. INSTALL SPEEDOMETER DRIVEN HOLE COVER SUB-ASSEMBLY**

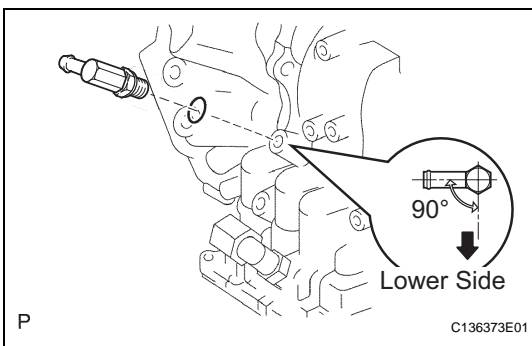
- (a) Coat a new O-ring with ATF, and install it to the cover.
- (b) Install the cover with the bolt.  
**Torque: 5.5 N\*m (56 kgf\*cm, 49 in.\*lbf)**

**73. INSTALL SPEED SENSOR**

- (a) Coat 2 new O-rings with ATF and install them to the 2 sensors.
- (b) Install the 2 sensors to the transaxle case with the 2 bolts.  
**Torque: 11 N\*m (112 kgf\*cm, 8 ft.\*lbf)**

**74. INSTALL OIL COOLER INLET TUBE ELBOW**

- (a) Coat a new O-ring with ATF, and install it to the elbow.
- (b) Install the elbow to the transaxle case.  
**Torque: 27 N\*m (276 kgf\*cm, 20 ft.\*lbf)**

**75. INSTALL OIL COOLER OUTLET TUBE ELBOW**

- (a) Coat a new O-ring with ATF, and install it to the elbow.
- (b) Install the elbow to the transaxle case.  
**Torque: 27 N\*m (276 kgf\*cm, 20 ft.\*lbf)**

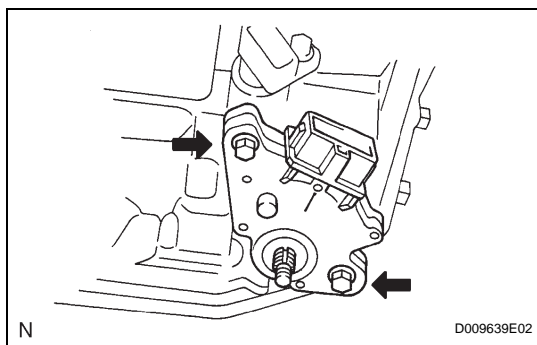
**76. INSTALL BREATHER PLUG HOSE**

- (a) Install the breather plug hose to the transaxle case firmly.

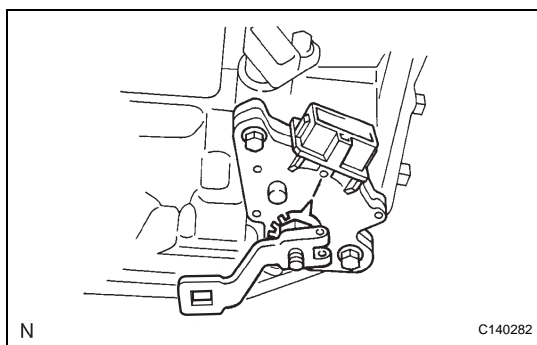
**77. INSTALL PARK/NEUTRAL POSITION SWITCH ASSEMBLY**

- (a) Install the switch to the manual valve shaft.
- (b) Temporarily install the 2 bolts.
- (c) Install a new lock washer and tighten the manual valve shaft nut.

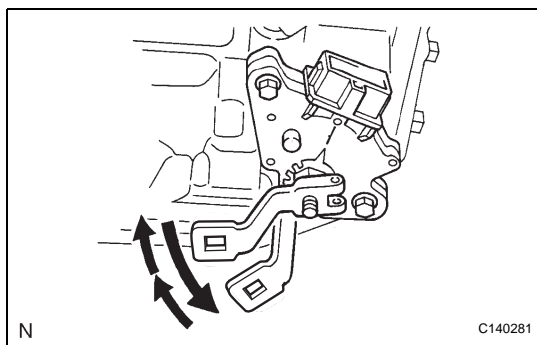
**Torque: 5.4 N\*m (55 kgf\*cm, 48 in.\*lbf)**



- (d) Temporarily install the control shaft lever.

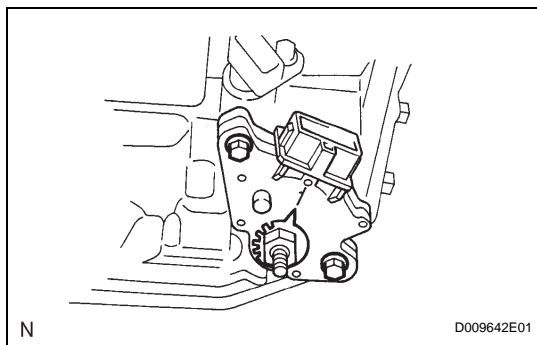


- (e) Turn the lever counterclockwise until it stops, and then turn it clockwise 2 notches.
- (f) Remove the control shaft lever.

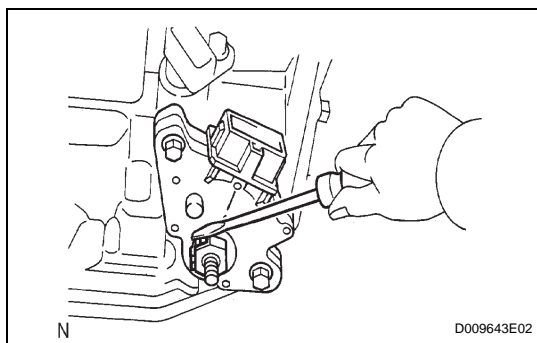


- (g) Align the groove and neutral basic line.
- (h) Hold the switch in this position and tighten the 2 bolts.

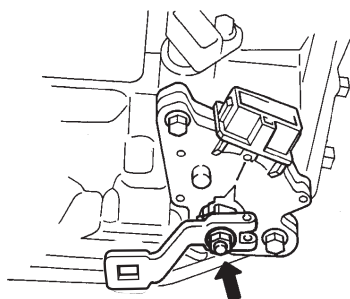
**Torque: 6.9 N\*m (70 kgf\*cm, 61 in.\*lbf)**



- (i) Using a screwdriver, stake the nut with the lock washer.







- (j) Install the control shaft lever with the washer and nut.

**Torque: 13 N\*m (130 kgf\*cm, 9 ft.\*lbf)**

**78. INSTALL SPEEDOMETER DRIVEN HOLE COVER SUB-ASSEMBLY**

- (a) Coat a new O-ring with ATF and install it to the speedometer driven hole cover.
- (b) Install the bolt and hole cover to the transaxle.

**Torque: 6.9 N\*m (70 kgf\*cm, 61 in.\*lbf)**